COTTON

Volume LXXIX
Number Nine
Ten Cents a Copy

JULY, 1915

Published Monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

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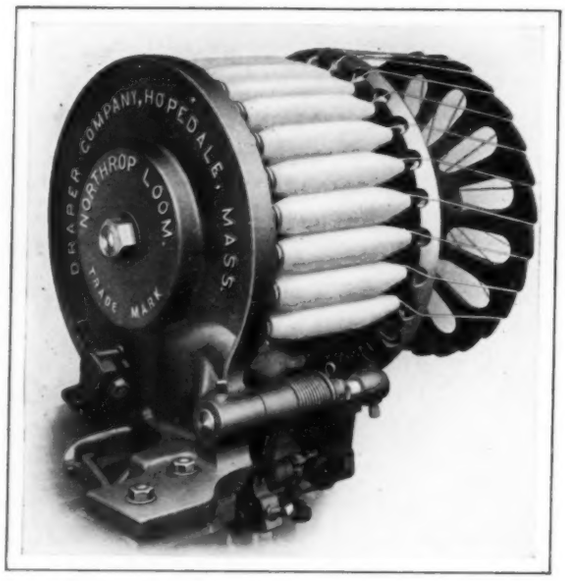

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COTTON

Published Monthly

Volume 79. JULY, 1915. Number 9

L. L. ARNOLD, Editor

Publication Office, Dalton, Ga. Editorial and Advertising Departments, Grant Building, Atlanta, Ga.

Entered at Dalton, Ga., Postoffice as second-class matter. Subscription Rates: Domestic, $1.00 for Two Years; Foreign, $1.50 Per Year; Canada, $1.00 Per Year.

Complaints of failure to receive Cotton regularly or of errors of any nature relating to subscription should be promptly made to the Atlanta office.

Contributions to the columns of Cotton are solicited and paid for after publication. The names of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertisements must reach Atlanta previous to the 10th of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

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USE MORE MEN.

The American Federation of Labor is not established for humanitarian purposes. It has a distinct and emphatic intent for its existence over and above the numerous reasons promulgated by its supporters. It might well adopt the unspoken slogan, "Use More Men," as the motto on its coat of arms and the basis for its official seal.

Only on a few occasions has this tendency showed itself in the open where the public could see it plainly, and without at least a partial concealment behind some one of the "common good" disguises so frequently adopted. Perhaps the most prominent example is the railroad "full crew" law, which has received the active support of the organization and has for its purpose the addition of a human fifth wheel to the efficient number of men necessary to handle a train.

In those sections where this law has been forced upon railroads, it has increased the operating expense and reduced in a like proportion the conveniences for comfort accorded the traveling public. Corporations controlled by a commission that can give orders without being responsible for the results, as is the case with the railroads, cannot pass the increased expense caused by a law of this nature directly to the paying public, but must, perforce, curtail at other points. Having due regard for the safety of their patrons, they necessarily have to leave this portion of their service intact and concentrate this necessary curtailment on that other branch of service which pertains to the personal convenience and comfort of the people who travel.

A much more common method adopted by The Federation is well illustrated by the active support accorded any movement tending to decrease the legal hours of labor for women and children. The amount of such decrease may be slight; the result to be attained seemingly trivial; therefore, state legislators are often disposed to humor the so-called labor faction among their constituency and place upon the statute-book the necessary law compelling this slight reduction in favor of women and children. Little, if any, thought is given to such a trivial change and it is thrown in as a mere matter of "sop." Objections on the part of employers of labor are met with depreciating smiles at the ridiculous idea of objecting to such slight changes and the whole matter is charged up to the general cantankerousness of mankind.

Let us throw aside all disguises; let us discard the seeming triviality of the question and face the bald facts as they are.

A cotton mill, or a knitting mill, is a vast complicated machine. It is designed by expert engineers and arranged to produce certain results. The operatives on duty become as much a part of this great complex machine and are as important to its successful operation as are the integral parts of a watch. To remove a part of these operatives

and stop their portion of the work immediately throws the vast machine out of balance and not only destroys the efficiency of the whole, but actually precludes its further operation.

The argument so often advanced that women workers should be thus relieved because of their frailty is futile. The work they do is as carefully adjusted to their physical ability as is the work performed by the hair-spring of a watch, and equally as important. A law compelling the removal of the hair-springs of watches for a period of rest each day because they are not as strong as other parts of the watch would be greeted with ridicule, but it would be equally as wise as statutes already passed in some states.

So much for the effect of such laws on the mill. Let us now consider the effect on The Federation of Labor and this will reveal the cause, the main-spring behind the movement. As already indicated, a mill cannot run out of balance, and because of this when a law compells certain operatives to work fewer hours than other operatives, two remedies remain open for the employer. First, he can purchase additional machines of the kind attended by the operatives affected by the law and employ more operatives to work a shorter period. Second, he can discharge the operatives directly affected (women) and employ other operatives not affected by the law (men). The first of these remedies is usually a physical impossibility because in the construction of the mill building no space was allotted by the architect for additional machinery made necessary by "freak" laws. This leaves open only the second remedy, and strips from Federated Labor its humanitarian disguise in one of its selfish efforts to indirectly enforce its silent slogan—*"Use More Men."*

SOUTHERN TEXTILE EXPOSITION.

The committee in charge of the Southern Textile Exposition is now making final plans for the assignment of floor space and other details. This exposition will be held at Greenville November 2nd to 6th; the convention of the Southern Textile Association will be held November 4th to 6th at the same place.

This exposition will be in the center of the southern textile industry, there being 2,500,000 spindles within a radius of 40 miles of Greenville, 7,000,000 spindles within 100 miles and 9,600,000 spindles within 240 miles; this will result in a large proportion of the attendance being practical mill men, and the committee, therefore, hopes to have a large exhibition of specialties, novelties and new devices pertaining to the industry; we believe this idea will appeal to all progressive manufacturers and builders.

The committee already have had a number of applications and are desirous of ascertaining the number of exhibitors and the amount of space they will desire. This space will be allotted in sections six feet wide and approximately eight feet long; space will be furnished machinery and supply exhibitors at a cost of twenty-five cents per square foot, the cost covering floor space and railings; special decorations, furniture, motors, power and other requisites will be furnished by contract at nominal prices. Any funds remaining over and above all expenses will be rebated on a pro-rata basis. To simplify matters, we shall be very glad to have all those who desire to exhibit, write the committee at once as to the number of square feet of space needed.

Since the exposition is to be held under the auspices of the Southern Textile Association, the requirement is made that at least one representative of each company exhibiting shall be a member of the Association. For the benefit of those who are not members, we will state that the dues are $2.00 per year and $1.00 initiation fee. All those desiring space should write at once to J. H. Spencer, Chairman, Machinery and Supply Committee, Box No. 572, Greenville, South Carolina. Remember, *first come, first served.*

A GLIMPSE OF THE TRUTH.

In the address delivered by Chas. J. Haden, president of the Georgia Chamber of Commerce, before the Cotton Manufacturers' Association of Georgia, at the last annual meeting, he made the following statement:

"Gentlemen, there is a set of people, whose names I won't call, but you will guess at, who have no greater weapon than a fountain pen which they use indiscriminately, who are trying to throw bricks because of some complaints as to child labor I have taken trouble lately to look into it, and it is my opinion—I believe I can prove it, if I were called on to do so—that you are educating at your own expense, infringing sometimes upon your own dividends, more poor people, at least ten times as many, as all the charities of Georgia. I am told that in all the number of schools so-called there are less than 600 being educated in primary branches by public charity, whereas I am told that the cotton mills of Georgia, you gentlemen, are educating something like 10,000. I think no greater thing could be said of the cotton mills of Georgia than that one thing. Besides, I think it is to your credit, gentlemen, that in these severe times you have been able to keep running against all the odds, that there might be found work, wages and bread for the people in your employment."

When so many misleading statements are being spread broadcast over the country by the paid agitators and faultfinders, in their guise of secretaries and special agents, it is indeed refreshing to catch a glimpse of the real truth about the cotton manufacturer and his attitude toward the children of the mill communities.

WELFARE CONFERENCE.

With the industrial growth of the South, there has been constant advance in all matters pertaining to the welfare of labor, in the cotton, lumber, mining, and other branches of industry. There are many examples of extraordinary achievements in welfare work on the part of Southern industrial leaders. With a view to stimulating progress, and in securing new ideas by interchange of views and opinions, a special Welfare Conference will be held, at Black Mountain, N. C., in connection with the Industrial Department of the southern summer school of Young Men's Christian Associations, July 16 and 17, 1915.

Discussions on the practical topics announced, and reports of actual welfare work being done by various companies, will make the conference of great value to all interested in the progress of southern labor. In order to facilitate local arrangements for the conference, those expecting to attend are requested to advise the Chairman of the Committee, Arthur J. Draper, Chadwick-Hoskins Company, Charlotte, N. C.

America Must Lead or Fall Into Decay*

BY WILLIAM C. WARD.

Last July it cost us $1.335 to liquidate every one-dollar debt we owed in London. Now it costs Englishmen $1.015, Frenchmen, $1.025, Germans, $1.14, and Russians $1.24 to buy American dollars with which to pay their growing debts in New York. Something revolutionary has happened. We were an introspective nation — a veritable China of the West—engrossed with our internal trade, fearful of foreign competition in our own markets, content to use European capital in such amounts that the annual interest tribute seriously curtailed our export trade balance and to that extent retarded our progress. We have become an outward-looking, progressive state, an aggressive competitor in the markets of the world, and the creditor of nations.

Since the panic which preceded the turn of the tide at the outbreak of the war we have purchased from Europe several hundred million dollars' worth of American securities. Hereafter the earning of the capital these securities represent will go into American pockets and ultimately find their way back into American industry as new capital, instead of going abroad to finance our competitors. The value of these purchases to us, therefore, is exactly twice face value. Our rate of production will increase accordingly.

Since the war began we have lent to foreign nations approximately $240,000,000. The buying from Europe of American securities simply stopped the eastward flow of annual interest payments. The making of loans to Europe has reversed it. Hereafter part of the earnings of European industry will come westward to swell the supply of productive capital. Europe will have to help finance American competition with her own industries.

Loans and investments in South America, which unquestionably will be made soon, will add their mites to the incoming tide of annual interest, and contribute further to our productive capital supply. The immediate result of these developments is no measure of their real significance. Their good effect is cumulative.

Many people believe that New York is to succeed London as the money center of the world. Such changes cannot take place quickly, but New York surely is headed that way. To be the money center of the world means a great deal. It is no mere matter of sentimental pride among bankers. Besides bringing an immense volume of business to England which otherwise would have gone elsewhere, London's position as a money center brought millions of pounds sterling into British pockets each year. Every international bill which passed through the London banks left in their coffers a certain per cent of its face value. All the world has to pay tribute to the financial center. It takes its commission going and coming on the great bulk of the overseas trade of nations

The Federal Reserve law has made all this possible for New York and other American financial centers by mobilizing American reserves, placing the currency on a credit basis and permitting the use of bankers' acceptances. The first two of these provisions make possible the healthy growth of American industries to whatever extent the world's demand may justify. The third makes it possible for us to finance the trade of nations, just as London has been doing, and thus has equipped us to compete for London's former dominant position. The development of this important branch of banking only has begun, and so far its field of operations has been confined almost exclusively to domestic transactions. When it begins to extend to our foreign trade, and to the trade of one foreign nation with another, we shall see our position as a financial center become a fact.

Meanwhile all nations are turning to the United States to supply their wants. Before the end of June we shall have supplied other nations with one billion dollars' worth of our product in excess of the value of what we have bought from them during the fiscal year. Apart from the demand for our staple products, $781,000,000 or more of unfilled "war orders" stand on the books of sixteen American companies. Even this variety of new business has wrought great changes in several industries. Motor factories and shops where printing presses formerly were built, have been transformed almost over night into shrapnel plants, and new factories have been erected. The demand for really skilled labor is becoming hysterical.

The steel industry is enjoying prosperity such as it has not known in years. Even the railroads are cheerful. The shipbuilding industry is running at capacity. The metal markets as a whole are more active than at any time since 1906. Developments in the copper trade already have become phenomena. Even at this early state of the revival, extra dividends are the rule. Copper sells above 20½ cents; spelter prices have passed into high territory above 29 cents, and even lead, in which the market has been proverbially heavy for a decade, is commanding seven cents a pound. All this leads inevitably to increased activity in domestic trade, as the fever spreads from one industry to another and the earnings of the war-stimulated trades pass into general commerce.

A GOLDEN FUTURE IN PROSPECT.

Unable to pay in kind for her enormous purchases, war-stricken, debt-ridden Europe has sent us $113,500,000 in gold since January 1. With our national wealth standing at the enormous total of $200,000,000,000, and with actual cash reserves in our bank vaults capable of covering $5,000,000,000 of immediately available credit, apparently we stand on the threshold of a golden future such as never has been revealed to any nation before.

Although born of the necessities of our erstwhile creditors, and not growing spontaneously from our own initiative, this transformation is none the less real. For these same reasons our obligation to deserve the good which has befallen us is all the greater. Had we won financial, industrial and commercial supremacy in fair competition with the rest of the world, and by the sweat of the collective American brow, there would be no doubt of our

*Extracts from an article in COMMERCE AND FINANCE.

ability to retain it. But as things are, we shall have to look alive.

The war cannot last forever. Europe will emerge from the war furnace under dire necessity for grinding the last atom of efficiency from her industries. A competitor who is obliged to compete always does business on very hard terms. Therefore it behooves us to watch what Europe is doing.

A new order of economics has been developing all over the world during the years in which we have been preoccupied with internal readjustments and the shaking-down of our industries to their present bed-rock basis. Behind the veil of the European war-cloud this new order is shaping itself rapidly into a definite system. Socialism, as such, has reached the limit of its usefulness, and is merging already into something totally different—a system in which capital intrenched by colossal national debts, controls more firmly than ever before, while compulsory labor at government-fixed wages is becoming more and more of an institution.

The mere fact of a general European war proves the absolute collapse of organized socialism, and this has been followed swiftly by the suppression of that temporizer with capital—union labor.

Labor in Europe fares better than ever before and this development unquestionably is to be a permanent one. An increase in the supply of commodities after the war will lower the cost of living rapidly toward its normal level. The shortage in skilled labor, however, cannot be made up for many years, and all history shows that wage advantages once gained seldom are relinquished.

Of course the tendency of all these developments is to raise the European cost of production toward American levels, and therefore to make our competitive position stronger than ever before. But it must be remembered that this applies to highly skilled labor only. Other changes are taking place which will establish industry on a basis of efficiency as yet undreamed-of.

Out in the Orient Japan has assumed virtual direction of the vast resources of huge and populous China. Whether the western world permits her to dominate China politically or not is of no importance. No power on earth can prevent the little Island Empire from developing China industrially and commercially according to her own ideas, from playing in the East exactly the same *role* of the "workshop of the world" by which England won her wealth and power in the West during the last century. To realize these national aspirations Japan has at her disposal vastly greater resources, superior knowledge and infinitely cheaper labor than was dreamed of by England one hundred years ago.

THE POLITICAL POWER OF UNION LABOR.

Europe foresees the result of this, and is making ready to meet it step by step. Even now, large numbers of Oriental laborers are being imported, not to take the place of the men in the trenches, because they are not sufficiently skilled, but to perform the unskilled labor for which there is demand in every branch of industry. Before the war the political power of the labor unions held the progressive development in check, just as in the United States; but the subordination of labor union interests to the public welfare, and the necessity for reducing production costs, now have introduced it definitely into the field of industry. Europe at last is awake to the fallacy of paying an intelligent man's wage to one whose duties require no intelligence, simply because he holds a union card. The industrial revolution thus begun is no less fundamental than, and exactly similar to, the introduction of machinery nearly a century ago. Everyone knows the result of that innovation.

Will the United States meet these conditions, and plunge boldly into the golden future which circumstances have wrought for her? Clearly circumstances are in our favor and it rests entirely with us whether we shall lead the world or fall into decay.

Only last week the newspapers informed us that despite our present need of a merchant marine, the Pacific Mail Steamship Company, whose vessels have carried the American flag on the high seas since 1848, has succumbed to an evil combination of the Sherman law and labor union legislation. On November 4, 1915, there will go into effect a labor union law which will make it impossible to operate a ship under the American flag. For whose benefit was this law enacted? Certainly it is not in the interest of American citizens, for only 5 per cent of the crews of American vessels are American citizens. And the same thing is true of labor unions in general.

Recent investigations into the personnel of the subsidiary organizations which make up the American Federation of Labor show that *over sixty per cent* of the total membership is alien. The total membership is 2,389,600, so that 955,840 union laborers out of the 38,167,336 gainful workers in the United States—just 2.6 per cent—are American citizens. Yet their organization has succeeded in *making* Congress exempt it from prosecutions for restraint of trade, and has engineered the passage of a law which will guarantee at least fifty dollars a month and board to "union" sailors for scrubbing paintwork and performing other menial labor which is well within the intellectual compass of a Chinese coolie or a Hindoo.

But there are signs that this delusion and a number of others are passing. There is a growing conviction that even American citizens who refuse to educate themselves to do skilled labor are not entitled to receive "American" wages for coolie labor. We are developing a racial pride. Such legislation as the Clayton bill, the exemption clause in last year's Sundry Civil Appropriations Act and the La Follette seamen's bill belong to another era. We may see the whole fallacious lot go by the board in time to allow the United States to take advantage of the brilliant future which lies at our doors.

The National Association of Cotton Manufacturers offers annually a medal to the student graduating with highest honors from the Textile Department of the A. & M. College, West Raleigh. The medal this year was awarded to W. I. Smith, Asheville, N. C., and was presented to him at the graduating exercises. This medal is awarded to the Textile Department under the following conditions: There shall not be less than 50 students taking the Textile Course; that there shall be a good equipment for instruction in cotton manufacturing which shall include designing of fabrics, and that the instruction shall be of recognized standard. All the requirements were complied with there being 54 regular textile students.

Southern Textile Association

The summer convention of the Southern Textile Association, which was held at Asheville, N. C., June 25-26, will be long remembered by the 350 members and guests present as one of the more interesting and enjoyable meetings in the history of the organization.

Thursday afternoon found the Langren Hotel, which was the Asheville headquarters of the association, crowded to the limit and the obliging officials striving to accommodate those who failed to make reservations sufficiently in advance. Those unable to secure rooms at the Langren were comfortably located at the nearby Battery Park Hotel, while a few went to the more distant Grove Park Inn.

Secretary Carter had the registration booth located in the parlor adjoining the lobby. There, also, was the very complete exhibit of cotton goods made at the Dunean Mills, Greenville, S. C., and in charge of Harold C. Smith. A nice exhibit of damasks was made by the Fountain Inn (S. C.) Mfg. Co., and another very complete exhibit from the Rosemary Mfg. Co., Roanoke Rapids, N. C., arrived too late to be seen by the majority, although it won the prize.

Part of the lobby was taken up by exhibits of mechanical appliances among which were the S. K. F. Ball Bearing Co., the American Kron Scale Co., the Bradley Stencil Machine Co., the Clipper Belt Lacer Co., the Mossberg Wrench Co., W. R. Widdup with the Widdup bearings for spinning frames, and the Day Adjustable Bearing Co., with adjustable bearings for looms.

The "Wear More Cotton" feature of the meeting, which was rendered more interesting by the competition for the prizes which had been secured for the occasion through the instrumentality of the *Mill News* of Charlotte, was remarkably successful. T. J. Digby, superintendent of the Oakland Mill at Newberry, S. C., was equipped with hat, suit and shoes made from cloth manufactured at his mill and dyed a peculiar shade of green, which he named "Langren." C. P. Thompson of Trion, Ga., had a unique suit of osnaburg manufactured in his mills entirely from waste. Frank E. Heymer was clad in white duck from his mills at Alexander City, Ala., and L. L. Arnold, editor of COTTON, was likewise fully equipped in white "Dixie duck" made by the Dixie Cotton Mills at LaGrange, Ga., and bleached by the Lanett Bleachery and Dye Works at West Point, Ga. Alonzo Iler and James H. Maxwell wore suits made from a new goods of the poplin order and of a beautiful shade, manufactured at the Dunean Mills at Greenville. There were many other suits which are not mentioned here, but those described are typical as showing the interest taken in promoting this work.

The prize winning suit for men was taken by W. M. Kendrick, southern salesman for the A. W. Harris Oil Co., who wore a hat, vest and trousers made of white corduroy, while his coat was of similar material but of a dark color. These goods were made in Georgia and tailored in Augusta. The prize winners among the lady contestants were as follows: evening dress, Mrs. A. B. Carter; coat suit, Miss Mae Lucille Smith; N. C. gingham skirt, Mrs. Ethel Thomas of *Mill News;* and the cotton hat and dress trimmings, Mrs. J. J. Iler.

Among the unique souvenirs of the convention may be mentioned badges of cotton duck printed in four colors and furnished with the compliments of Superintendent J. M. Davis of the Newberry (S. C.) Cotton Mills. The neat pins of flag design to attach these badges were furnished by Alonzo Iler, Southern manager for L. R. Wattles & Co., who also distributed little celluloid pocket cases containing court plaster. Cotton programs printed in three colors were furnished by James H. Maxwell, southern agent for the Keever Starch Company. Mr. Maxwell and his able assistant, J. J. Iler, also presented the members with wash ties made from Dunean Mills goods. S. C. Thomas, southern manager for the Seydel Mfg. Co., gave "Sanipac" cotton handkerchiefs as his souvenir of the occasion. Another cotton souvenir was a twisted hat cord by the American Banding Co.

Harry Scrivens, representing the Philadelphia Belting Co., supplied safety matches in a brass case, while E. M. Terryberry, southern agent for Howard Brothers Mfg. Co.,

THE PRIZE WINNER AS HE APPEARED AT THE CONVENTION.

gave a handsome gold filled clutch pencil for pocket use. The International Acheson Graphite Co., The Texas Company, the Dixie Packing Co., and A. G. Smith of the National Starch Co. also distributed pencils.

Friday Morning Session.

The first business meeting on the program started about noon with President E. E. Bowen in the chair. He presented Hon. Marcus Erwin, city attorney of Asheville, as the representative of Mayor J. E. Rankin, who was unable to be present. Mr. Erwin declared that the textile association represents largely the brains and capital of the South. He remarked that he was delighted to see such a large attendance and added that he was not surprised that such a large crowd had gathered for the Asheville meeting, as that city always attracted many southern people at this particular season of the year. The prosperity of the cotton mill men, the speaker said, had a great effect on

local conditions. Silent spindles and idle looms throughout the southern states meant unemployed men and women, business stagnation and suffering at Asheville, which was dependent in a large measure on visitors for its prosperity.

Secretary A. B. Carter was then called upon to respond and said in part: "It is with pleasure and with pride that we greet you in this beautiful city of Asheville, the capital of the historic county of Buncombe, which was established in 1791 by Colonel Pitts.

"North Carolina has a wonderful history. On her shores was born the first white child in this country. History does not record the deeds of braver men, and poets never sung of more beautiful women. We are glad to enjoy these high mountain tops, catching all the crimson glories of gorgeous sunsets, preserved for man's delectation, and the exquisite paintings of beauty seemingly made only for visions of the blessed in the enchanted realms of Paradise. We love North Carolina for the statesmen she has produced; we love her for the history she has made; we love her for her heroes, whose names shall live forever in song and story; we love her because our people are bound to her people in the sacred ties of blood, and because her sons have suffered and died on many a battlefield.

"This morning I stood and looked upon that beautiful granite shaft, perpetuating the memory of one of North Carolina's most gifted sons, and do you know, if it had been mine to have chiseled the epitaph of that wonderful man I would not have placed thereon the record of his services as a soldier; of his sublime devotion as a governor; no thrilling periods of the eloquent orator and redeemer of his state; not the wise utterances of the senator and sage; I would not picture him as he stood in latter years like Pompeii's pillar, conspicuous and almost alone in his unapproachable and unimpeachable integrity; I would not picture him as he lay beneath a wilderness of flowers, kissed by the soft rain of a nation's tears. No! I would carve on that shaft the picture of Zeb Vance as he labored as a young, awkward North Carolina boy, with a determination to win and to serve his state with the highest honor. His name will live and brighten the history of this state forever.

"The Southern Textile Association is composed largely of men who earn, men who work, and men who 'do something.' We stand for cooperation, not competition. That is why the Southern Textile Association was organized, and it is one of the most significant movements that has been promulgated for the cotton mill industry of the South in the past ten years. When men come together to discuss the common good they are bound to take hold of new ideas, and absorb information which they can apply with profit, to their own business. It is also true that the mill owners and the public look with respect upon a vocation which is important enough to have an organization. That bespeaks the presence of so many successful superintendents, overseers and 'grip toters' here today. I would not have you to forget the drummer, who travels all night and toils all day to win comfort for wife and children. He is a far better citizen than the most successful speculator on Wall street. Young ladies, when the time comes to marry, say 'Yes' to the good-natured, big-hearted drummer, for he is a spring in a desert, a straight-flush in a weary hand, a thing of beauty and joy forever, and, he will never be home to worry you!

"It should be the desire on the part of every overseer and superintendent to find out all he can about his business. Be the best in your line. Locate the trouble in your department before it occurs. Be a leader and an instructor. He profits most who serves best. The man who gives the best services receives the most in return, and the best way to find out how to serve better, and how to improve the methods of doing old things is to attend the Association meetings. This Association does not amount to much of itself. Its value is not derived from being able to say, 'I belong,' but from actually taking part in its work, doing something and helping to make it a live factor among the cotton mills. To get anything out of this Association, you must put something into it. If you are interested in a thing you will give time and thought to it, and when you have made an investment of that kind, you will naturally look for dividends, and it will be remarkable if you don't get them, for interest, like flint on steel, strikes a spark that kindles interest and enthusiasm on the part of others, and when things get started in an Association it is remarkable how much can be accomplished."

At the conclusion of the response came the

President's Address

by President E. E. Bowen who said in part:

"At our last meeting I drew at some length upon your time, offering suggestions, which from my point of view seemed timely for increasing the efficiency of our fellow workers in the mills. And it is along this same line of thought that I wish to make at least a part of my remarks here today. Although I am not a pessimist nevertheless I think that we will all agree there is always room for improvement, and that none of us have yet reached such a state of efficiency, that we cannot be improved upon or be made more efficient by 'swapping' ideas with each other.

"Furthermore, the older I get, the more closely I become wedded to the convention, that every man who has met with some measure of success, owes it to his less fortunate neighbors to see to it, that nothing that he can do is left undone, that might increase their earning power, promote their health and happiness and contribute towards making life sweeter. In order to be thoroughly efficient I think it necessary to be thrifty, economical and contented and while we people of the South, have made wonderful progress along many lines, I fear that we have not progressed as fast along these three as we might have done. But to say that we have not made a substantial gain, even in these, would be to ignore the facts that constantly confront us; because, we all know scores of mill workers who are thrifty, who are economical and who are contented.

"When I say that we are making progress along lines that indicate a more prosperous and loftier citizenship, no doubt I incur the wrath of those scalawag agitators, who make their living, and sometimes their fortune, by appealing to the sympathetic side of the well meaning but ofttime misinformed philanthropist, who neither has the time nor takes the pains, to acquaint himself with the actual conditions that prevail. He is content to form conclusions from reports furnished by those Sons of Rest, those parasites, who know their job depends upon their ability to picture the mill operative as a poor, ignorant, overworked and underpaid being, wholly incapable of discerning right from wrong, breathing the filthy air of the

mills into a pair of diseased lungs, living in filthy huts and speaking a brogue entirely foreign to intelligent people.

"I regret to have to say moreover, that the professional agitators, do not have a monopoly on the art of misinforming the general public about the true makeup of mill people. How many of you have repeatedly seen displayed in bold type in a number of our southern papers, accounts of the petty shortcomings of Joe Brown or Jim Smith, an operative of the Jones Cotton Mills? Some of them seem to take special pains to give a mill man's name and occupation when he happens to depart from the path of rectitude. I do not charge that our newspaper friends purposely hold us up for ridicule before the general public, but I do say, that a vast majority of our mill people see it that way and it seems to me that it would be the part of wisdom to accord our people in the mill district the same courtesy that is given our brothers in other lines of endeavor.

"It is certainly not conducive to the upbuilding of the morals of a community to speak slightingly of one unit of its citizenship, and I stoutly believe that if all our

PRESIDENT E. E. BOWEN.

newspapers would only take the time and pains to impartially inform themselves, and their readers as to the actual progress we are making, there would be far less class feeling, more mutual confidence and a more wholesome cooperation between capital and labor. So let us hope that our daily and weekly press will join us in the noble fight that is being waged by our mill papers against the false representation of the true conditions that obtain in our mill communities. This cooperation will tend to eliminate the lines of class cleavage and to weld together the best Anglo-Saxon blood that inhabits any land into a most patriotic citizenship. Let us develop a wider consciousness that we belong, as Professor Dyer, of Vanderbilt University, expresses it, 'to the reserve army of the South.'

"I am opposed to child labor, as all mill men are, but my experience has invariably been that the child of the mill community, whose parents work in the mill, is far better off in the mill at work when school is not in session, than when turned loose on the streets, or when entrusted to an irresponsible cook. The mills are not to blame for our illiteracy. This condition began with our people before coming to the mill village. The fault lies with the school system of the past, that was inadequate and failed to provide opportunities for our people located far from industrial centers, and highways of trade. *Give us a compulsory school attendance law, with an enforcing clause, and the child labor problem will be solved in the best possible way.*

If you will pardon a personal reference, I would like to ask of our critics that they draw in their imaginative minds, a picture of the president of this Association in his early teens, as he packed all of his belongings into an old-fashioned shoulder strap satchel, left his cabin home in the mountains of an adjoining county and walked sixty miles to Captain Smythe's mills at Pelzer, seeking opportunity, and then tell us and the world if they think the cotton mills could possibly be a curse to a boy in such a predicament.

"Coming more closely to my theme of thrift and economy permit me to suggest that the first step towards these virtues is contentment, or to say rather that contentment, thrift and economy go hand in hand. For a few minutes let us consider ways and means to bring about these conditions. Good running work is the first essential, pleasant homelike surroundings, with encouragement to save and to invest and opportunities for children, follow in their order. The sum of all these is contentment and you will agree with me that we face our hardest problem in providing these essentials, because it is an established fact that the majority of our people are slow to make investments, hence it is obvious, that the opportunities which would appeal to the largest possible numbers of our people have not yet been adequate. We have tried the savings bank and find that not a great many take to it; we have tried the building and loan association only to find that most of us get weary and quit before we reap the benefits; we have tried the buy-a-home-on-the-installment-plan, but the majority consider the road too long and the goal inaccessible. Then, gentlemen, I submit, that we must find something easier, something that shows a quicker and larger return. That something, in my judgment, is a cooperative community store. It affords an opportunity for the people to invest in small amounts with quick returns on their investment. It shows promptly and substantially the value of investment, and in my opinion does more to make the industrial worker contented than anything we have thus far inaugurated. It makes a man feel an interest in the community he would not otherwise feel. It gives him the satisfaction of knowing that he has a 'look in' to his merchant's business, to see that he is getting a square deal. And it also serves to discourage the ruinous credit system which is altogether too prevalent in our mill communities.

"This plan of merchandising has been introduced into a few of our southern mill centers, and in many other localities and in each case that has come within my knowledge, the enterprise has become a success. We have in the town of Greer, two flourishing cooperative stores, one of which paid a semi-annual dividend of 20 per cent for the first six months of its existence, the other, which pays an annual dividend will measure up to the same success. The Hampton Mill cooperative store of Columbia, wound

up its first year's business last January, by paying a 50 per cent dividend.

"I firmly believe, that investments that show such returns and which are carried on entirely by the people themselves, will appeal to our folks and that sooner or later, they will, if given an opportunity, invest in these enterprises and by becoming investors will develop a feeling of contentment not yet experienced. So I believe it would be well for the managements of our mills to look up the merits of this proposition and to encourage it in every legitimate way even to the extent, as some have already done, of furnishing the store building rent free."

The next address was on the Relationship of Mill Treasurers to the other Officials of the Corporation by

Captain Ellison A. Smyth.

President of the South Carolina Cotton Manufacturers' Association. Captain Smyth said:

"Ever since the Southern Textile Association was formed, I have urged the superintendents and overseers with whom I came in contact to join your Association and attend the meetings. I believe membership in such a body as yours is of direct and permanent benefit to all who are eligible for membership. Mill men cannot get together for even a few hours and discuss mill problems without direct benefit, and in my experience I have never visited other mills and had intercourse with other mill men, overseers, superintendents or treasurers, and discussed mill problems without gathering valuable information and profiting by able suggestions. The Good Book tells us that man cannot live to himself alone, and this applies particularly in my opinion to cotton mill troubles and problems, which are so varied and of such a complex nature. Men cannot live like hermits, or be like the ostrich and stick their head in a bed of sand and think they are hidden from view and be successful managers and up to date with their mills.

"In a town not far from here, where there are several large cotton mills, a stockholder who had large holdings in the different mills, and who was rather eccentric, made it his business one day to visit each mill treasurer and ask him to what he attributed his success as a manufacturer, saying to one man, you had been a druggist, and to another, you had been a lawyer, and to a third, you had been a merchant, and to another, you had been a cotton broker and had no experience in cotton milling. Now explain how you have made a success of cotton manufacturing. Of course the answers were very different. One man attributed his success to his mercantile education; another to his being a good judge of cotton and a good judge of the different phases of the cotton market; but a young man who had made a marked success answered that his success was due to his good sense in selecting able men, smarter than he was, in his opinion, to run the different departments of his business, and he was the gainer by their ability. This was a sensible and correct answer, and the smart man who succeeds in life is the man who gathers around him the ablest brains and the quickest intellects, coupled with executive ability, and he uses in the successful management of his business the brains of other men.

"In most of the textile corporations of the North, the president is a figurehead to a large extent, and presides only over the meetings of the stockholders and of the boards of directors, and the executive officer is the treasurer. Owing, I suppose, to the dearth of material in the South years ago when the cotton manufacturing industry was in its infancy, the two offices were combined, and the executive officer was called the President and Treasurer, but it is really as Treasurer that he has the most work to do, particularly in times of depression, when goods are hard to sell and money is even harder to borrow, and when there are numerous failures in the cotton manufacturing business, and bankers and stockholders are suspicious and uneasy and scrutinize carefully and with great exactness any application for a loan. Those are the times—and we have just been passing through them—when the treasurer's nerve and ability are tested, and when he has to satisfy the parties from whom he gets financial assistance, at the same time keeping his mill running, and arrange to carry

CAPT. ELLISON A. SMYTH.

a large stock of unsold goods. Treasurers pass many sleepless nights and have many worries that the general public do not know of or appreciate.

"Every southern cotton mill corporation is under lasting obligations to New York and other Northern bankers for the financial assistance, forbearance and kindness with which they were treated last fall during the strenuous times, and it is in periods like this that the superintendents can aid the financial management by economy in administration and an earnest endeavor to aid in overcoming unforeseen and unexpected difficulties.

"The relations between the Treasurer and his Superintendent should be close and confidential in every respect. The Treasurer should have the appointment of the Superintendent and fix his remuneration and define his duties. The Superintendent should feel that his loyalty to the Treasurer and to the corporation should be unquestioned, and a prudent Treasurer keeps in full accord with his able Superintendent, relying on him for the full production that the machinery can give, looking to him to produce those goods at as low a cost as is possible, even requiring the Superintendent who has been given poor stock to make good goods and not to grumble. A prudent Treas-

urer will not interfere with the management of the help or the selection of the overseers except in a general way. He should always uphold the authority of his Superintendent and give him free rein in the selection of his overseers, and the overseers should be allowed free rein in the selection of their second hands and section men. A cotton mill should be largely run on a military basis, like a regiment, with the Superintendent as the colonel, with the overseers as the captains, and the second hands and section men as lieutenants and non-commissioned officers. The authority of each should be recognized, and the appointment of subordinate officials should be accorded to the junior officers as far as is practicable. It would be unwise in a board of directors to force a Superintendent on a Treasurer in whom he did not have confidence or who he felt was incompetent; and so in turn an overseer should not be forced by the Treasurer upon the Superintendent, or the second hands and section men upon the overseer if they did not wish to employ those men. Hearty cooperation will not be had unless there is perfect confidence and consideration shown to all under officers. A spinner cannot make good yarn or turn it out in sufficient quantities as may be wanted by the weaver unless he gets good roving from the card room; and in turn the weaver cannot make good cloth at a proper cost unless he has good yarn from the spinning room and an abundance of it. I have known of mills where there was friction between the carder and the spinner, or between the spinner and the weaver, the result being great injury to the operation of the plant, and the boss carder seemed to delight in withholding the supplies from the spinner, and the spinner careless and indifferent about furnishing the warp and the filling to the weaver. Nothing will tend more quickly to disorganization in the running of a mill and the making of poor cloth, leading in the end to bankruptcy, than jealousy and lack of cordiality and faithfulness on the part of the heads of the different departments. My experience has been that wages are not so important in securing and retaining good help, as to have the work run well, the ends kept up and the warp threads not breaking too frequently on the looms. To accomplish this result requires good stock to begin with, careful, honest manipulation of the work by the different departments, all working together, pulling together, feeling that the success of the mill corporation, in large measure as it does, depends upon their cooperation and loyalty.

"My experience has been that to a very large extent the employment of help should be in the hands of the Superintendent, who would also have charge of the mill cottages and the assignment of houses to newcomers, but the right of discharge, the right to maintain authority in the different rooms, and to enforce his just rules, and orders by discharge if necessary, should rest with the overseers as well as with the higher officials. Appeals are frequently made from the decisions of the overseers or the Superintendents of the mills to the mill Treasurer, but it is unwise for the mill Treasurer to handle such questions directly. He had best always refer it back to the Superintendent and quietly have a private interview with him and find out the merits of the case, and let the Superintendent finally handle it. The mill Treasurer will always find out there are two sides to every question.

"The responsibility of the mill Superintendent, of the mill overseer, is very great. He is looked up to as a model by the boys and girls, by the young men and young women under his control. Many a boy in the spinning room looks upon the overseer as a man to be patterned after and copied as one who has attained a position of importance in the commercial world, and in his opinion, whatever the overseer does is right. Therefore, I repeat that the responsibility of those who are in charge of help, especially young help, is great and has largely to do with the moulding of the characters of the young people under their control and brought within their influence. This responsibility that we owe to each other is hardly recognized. Many a word is spoken in jest or in idle conversation that remains fixed in the minds of those who hear it and is treasured up and remembered. Words are said to be meaningless things, but once they are uttered they can never be recalled, and they often rankle and do everlasting injury.

"You men who are members of this Association occupy positions of trust and responsibility, and have been selected for those positions because you have showed unusual ability, above the average, and are leaders of men—thinkers as well as doers. It is your province to guide and direct the manual labor of others, to plan for them, and to aid in executing orders and schemes for the success of your corporation. You are Thinkers; and the following beautiful lines by Berton Braley, called "The Thinker," state the position in the manufacturing world you occupy:

Back of the beating hammer
By which the steel is wrought,
Back of the workshop's clamor
The seeker may find the Thought.
The Thought that is ever master
Of iron and steam and steel,
That rises above disaster
And tramples it under heel!

The drudge may fret and tinker,
Or labor with lusty blows,
But back of him stands the Thinker,
The clear-eyed man who knows;
For into each plow or sabre,
Each piece and part and whole,
Must go the brains of Labor,
Which gives the work a soul!

Back of the motor's humming,
Back of the belts that sing,
Back of the hammer's drumming,
Back of the cranes that swing,
There is the eye which scans them,
Watching through stress and strain,
There is the Mind which plans them—
Back of the brawn, the Brain!

Might of the roaring boiler,
Force of the engine's thrust,
Strength of the sweating toiler,
Greatly in these we trust.
But back of them stands the Schemer,
The Thinker who drives things through;
Back of the Job—the Dreamer,
Who's making the dream come true!

"Let us all remember, whether we are treasurers, superintendents, overseers or section men, our responsibilities to each other, our responsibilities to the corporation that hires us and which is entitled to our best thought and our best energies, and so act that what was said of the good man in Holy Writ may be said of us when we are gone: 'He shewed thee, O man, what is good; and what doth the Lord require of thee, but to deal justly, and to shew mercy, and to walk humbly with thy God?'"

At the close of Capt. Smyth's address he was unanimously elected an honorary life member of the association in recognition of his services in behalf of the textile industry in the South and as a token of the esteem in which he is held by the members of the organization. The certificate of life membership was presented by T. B. Wallace, of Greenville, S. C., a former president of the association. His remarks were most timely and Captain Smyth was visibly affected by the high tribute paid him by the organization.

A valuable addition to the printed program was the paper by W. R. Lynch, manager of the department of welfare and health at Spray, N. C., entitled

The Evolution of Welfare Work

in Southern Textile Communities. Mr. Lynch discussed his subject in detail and in part said:

"We are to consider together the evolution of welfare work in southern textile communities. Surely this is appropriate considering the large share many of you gentlemen have had in making the history of the industry in the South what it is today.

"Undoubtedly the early employer felt that he had good reasons for the semi-autocratic policy of the earlier years. The paternalistic guidance of the manufacturer in those days may have been essential for the successful operation of the plants. The process of molding into efficient skilled workmen that mass of raw material which so flooded these communities during those early days certainly required the closest personal touch of the executives of the mill, and the enforcement of rules which may have seemed autocratic, was absolutely necessary to preserve order. In the light of these earlier experiences, uninformed and less kindly disposed people have tried to represent them as conditions common today. Only recently a writer in describing conditions existing in southern cotton mill communities generally said that it was very closely related to benevolent despotism. This audience knows that such statements are untrue, and that if such conditions do exist it is only in extremely isolated cases, and that experience has demanded and is forcing a change from these antiquated policies.

"The marvelous rapidity with which the industry has grown during the last few years, the increasing complexity of the problems presented and the strenuous demands which competition for production have made upon the time and attention of the operating executives of the larger mills, has forced the necessity of creating a department under the direction of trained welfare specialists to assume the responsibility for the conservation of the health of the employees and give general direction to community betterment efforts. The textile industry was not the first of the great industries to be confronted with this necessity. The United States Steel Corporation seem to have been pioneers, closely followed by Standard Oil and the large lumber industry. In each of these the Industrial Department of the Young Men's Christian Association has had a large share in the development.

"A close study of the work of these welfare specialists brings out certain fundamental principles necessary for the successful conduct of community welfare activities. The foremost of these being based upon that inherent desire for independence so manifest in our American people, which encourages altruistic service and absolutely eliminates any dictatorial or paternalistic attitude between employer and employee.

"Many employers in early years felt the apparent lack of appreciation of efforts directed for the benefit of employees. They saw the base ball suits they had purchased and presented the team abused, misplaced or carried off, perhaps band uniforms or instruments woefully misused. Great barbecue dinners scattered and wasted before their very eyes, fireworks displays or balloon ascensions that created more criticism than favorable comment. We ven-

W. R. LYNCH.

ture to suggest that had the responsibility and perhaps part of the expense been mutually shared with those for whose benefit they were principally designed, there would not have been the same tendency toward destruction or the lack of appreciation so manifest. This same thing applies in a more vital way to the larger community activities such as the church organizations and public schools.

"Other illadvised employers have been known to bring into their communities at considerable expense or with the promise of a pension job professional ball players, band masters and the like. Invariably such a policy has resulted in disaster, the favoritism has created dissatisfaction among large numbers of employees. The mill has suffered financial loss resulting from the disorganization of the working force by the allotment of time during mill hours, for practice and play which in many cases has been necessary in these company projected activities.

"I would not be understood as condemning the band or

baseball, I do, however, most earnestly recommend that if these things are engaged in, it must be under the leadership and the initiative of the employees themselves. A firm rule should be established that would tolerate no interference with the operation of the plant by these secondary things.

"Well may the management encourage them, especially, base ball, by wise contributions to their support. This, however, should not be construed to mean the entire expense.

"Other employers, continuing antiquated customs, have insisted upon the donation of articles of food on a large scale to the families of their communities at certain periods of the year. A study of such a policy has failed to prove the advisability of it. Many of the recipients in place of showing appreciation were severely critical, some suggesting that they would prefer an addition to their pay envelope and make their own selection of food. Certainly this policy is not calculated to inspire personal pride and independence on the part of the recipients.

"Another principle emphasized by the welfare specialist is that no company or corporation bringing people to reside in its community has the moral right of existence unless it can offer to these people the assurance of healthy congenial surroundings.

"The human factor in the industry is its greatest asset and must be conserved. Progressive manufacturers realizing this are devoting proportionately more time and attention to this factor than even to the selection of machinery or the disposal of their products. They are likewise insistent that others failing to do this shall not hide behind their efforts, but that each tub shall stand on its own bottom. They are further insistent that the laws of the land shall be rigidly upheld and that any employer violating the laws affecting the industry shall be brought to a personal acount for it before the majesty of the law.

"I have investigated industrial conditions in various sections of the country and find that in no industry are conditions better and few as good as those existing generally in the textile communities of the South. We do not, of course, deny that there are exceptions, but they are few. Mark this, *the textile industry in the South is spending more money, in proportion to the investment, for bettering the conditions under which its people live and work than any industry in the United States.*

"Undoubtedly the *Textile Industry* has contributed more to the development of the 'New South' than any other single factor.

"The hearty support and cooperation on the part of the employees in community uplift efforts, such as hospitals, schools, churches, dispensaries, tubercular camps, milk stations for sick babies, health and sanitary equipment and modern methods of sanitation, trained visiting nurses, community social workers, domestic science and gardening experts has made their success possible. The splendid work of the Industrial Department of the Young Men's Christain Association and kindred organizations and a long list of other activities too numerous to mention, are making their contribution to the amazing development of the South and the evolution of welfare work in southern textile communities. Many of these communities may safely challenge the world in the matter of health, thrift, contentment and *esprit de corps.* And yet let us not be weary in well doing, for however much has been accomplished, there yet remains much to be done."

After making some announcements President Bowen adjourned the meeting until Saturday. The members then assembled on the roof garden and were photographed. The remainder of the afternoon and evening were devoted to social pleasures among which were a trip to Biltmore Estate and dancing, during the evening, on the roof gardens of the Battery Park and Langren Hotels.

Saturday Morning Session.

The Saturday morning session was called to order by the president at 10:30 a. m., and the first speaker, C. W. McSwain, associate professor in designing and weaving at Clemson College, presented his paper on

The Textile School

and its Place in Industry. Professor McSwain said in part:

"There is one word that we have had dinned into our ears until it has become so common that we almost lose all idea of its correct meaning. That one word is efficiency.

C. W. MCSWAIN.

Efficiency has been so constantly held up before the commercial and industrial world that to some of us it has become almost a bogey. So constantly has it been thrust upon us that we sometimes are constrained to ask is efficiency a paying proposition? Is it conducive to the best results for employers and employees alike? Above all, what is efficiency?

"This last question is the one which most often comes to our minds and some of us will answer it in one way and some in another. It has almost become so we will not pronounce a thing efficient until we have obtained the opinion of an efficiency expert. In the lay world no one will say that a piece of art, be it bronze, marble or canvas, is a masterpiece until some high authority has pronounced it so. In like manner have we come to deal with efficiency. If anyone now asks us if such and such a man or process is efficient we immediately resort to the opinion of an efficiency expert on the subject. Such conditions should not exist. We should have a clear conception of what this word means.

"To my mind, the difference between efficiency and

SOUTHERN TEXTILE ASSOCIATION ON THE ROOF GARDEN AT THE LANGREN HOTEL.

inefficieney is the difference between two types of men: one goes to work in the morning when the whistle blows with no thought of the work he is to do; he just goes and does it automatically, paying more attention to the thought of how long it will be before the dinner whistle blows than to the work he is doing. Such a man always goes through life doing the work and coming and going at the beck and call of another. On the other hand is the one who is completely in love with the work he is donig. He it is who studies his work, not only while in its actual operation, but who is constantly planning a better way whereby the thing may be done to better advantage. Such a man must have imagination. He must imagine that such and such a thing could be done in a certain way. All great artists have the sense of imagination trained to the utmost point.

"We all have, at times, a touch of imagination or an intuition just as the Irishmen did when acting as pallbearers at the funeral of a deceased brother. It seems that this Irishman conceived the idea, and so had it embodied in his will, that the pallbearers at his funeral should receive a stipend of ten dollars each. In order, however, to obtain this sum strict rules were to be observed. These were, that these hired mourners should walk one behind the other in a straight line behind the hearse with heads bowed in the attitude of devout mourners. Anyone not observing these rules should forfeit his pay. The men undertook the job and the procession started out in proper accordance with the old man's will. It seemed, however, to the hired mourners that the march was unduly long and tiresome. So they communed among themselves and, finally agreeing each to contribute his pro rata share in making up the loss to him, one of the number was induced to look up and tell the rest where they were. Accordingly this man did look up and immediately cried, 'Faith, and ye may as well all look; for the hearse turned up Fourth avenue and we are within six steps of the ocean.' Some of us are at all times walking behind a hearse containing a worn out, dead process or idea, our only object being to secure the reward offered for such work. But do we ever look up when the intuition strikes us? Some of us may, but others will blindly continue on their way until swallowed up by the ocean of routine and daily automatic drudge.

"The young man of today, more than ever before, should be constantly on the alert to grasp a new idea, and be trained in that sense of imagination which is the germ of all success and efficieney. And the Textile School, I assert, is the place where this sense of clear thinking can be encouraged.

There are three periods of the Southern Textile School which I desire to discuss in order to bring the matter more clearly before your minds. These are, first, the past of the school; second, the present condition; and, third, the future of the school.

"As you know the establishment of the school in the South was in connection with the agricultural and mechanical colleges, and the supervision of these schools was in charge of men who were not in sympathy with the industry. In most cases if they were not altogether antagonistic, they were certainly lacking in the knowledge of the needs of the industry. Such a condition proved that the mill managements did not consider the school as a part of their interests, and no manifest appreciation of their work was shown.

"In addition to the fact that the school was not at first considered a part of the industry, the men who attended them were usually not those who had any previous practical experience in mill work and they conceived the idea that all they had to do was to show their diploma and jobs would come tumbling over each other to encircle them. These conditions were not calculated to show the results possible to be attained, and some of us began to doubt the real usefulness of the school.

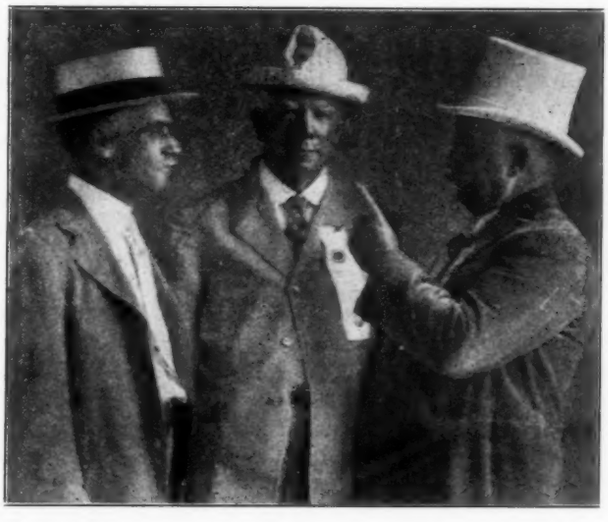
"The present position of the school in the industry is one of seeming undecidedness. Some of you have begun to think that the school would be a good thing if it were run under certain conditions. Others of you still think that the only way for a man to learn the business is to constantly apply himself to the practical job. But you must remember that it is a hard thing for the average man to work hard on the same job and at the same time give the proper thought and study to the details as would be possible if he were to stop actual work and spend a small portion of his time to the study of the job.

"Then, some of us are undecided as to whether the school should come after several years of practical work, or whether the school should come first. Also some think that the school should come along with the practical work in the mill. This idea seems to involve the principle of having the students divided into two sections. One of these sections to go to classes one week while the other is at work in the mill. This to my mind is an admirable scheme, but would have to be carried out in connection with some mill, or would require the installation in the school of practical units of machinery for the practical and economical running of the product to be produced. This scheme also embodies the idea of making the school self supporting by putting on the market the product thus obtained. Personally this method has favorably appealed to me. I do think that if the school were under proper practical management such a scheme could be worked out to an ultimate success.

"All of these things, which I have heard discussed by mill men in the last few months, tend to show that people are beginning to realize that the school has a place in the industry but they are undecided as to the best method by which the most good can be accomplished. What, then, is to be the future of the textile school, and how can it best accomplish the work to be done?

"As in all other things, we can best apply remedies in the future that have been taught in the school of experience, so we must turn to the past and profit by the mistakes made in the establishment and operation of these textile schools. I have referred to the establishment of these schools under the control of men not in touch with the industry. This, I assert, is not conducive to that wholesome feeling that should exist between the industry and the school. In other words the manufacturer does not look upon the school as in any way connected with himself, and until he does look upon it in this way the results obtained will not be the best. Then how can it be possible for this condition to be brought about in the future? The only way that this can be done is to see to it that men are put in charge of the schools who know the needs and who are in constant touch with the industry. It might be advisable for agricultural and mechanical colleges to establish Boards of Advisors, composed of practical mill men, who would be in a position to advise the best methods and studies to be pursued to meet the demands of the manufacturer. Such a method would cause the industry to look upon the school as *its school* and not something foreign to it. If this could be accomplished a marked result for the better would be shown.

"As our experience in the past has been that not enough mill boys attend, then all inducements should be brought to bear upon these boys to take a course in one of these schools. It is true that a number of graduates have applied themselves continuously to the industry and have been rewarded by high and responsible positions. But we in our minds cannot conceive of the benefit that would have resulted to both the industry and the men themselves if a greater number of these graduates had been practical mill boys.



CAPT. M. G. STONE, THE DEAN OF THE ASSOCIATION, CENTER; H. F. MOODY, LEFT; W. M. KENDRICK, RIGHT.

Another work that the school must feature in the future in order to take its proper place in the industry is to run at least a part of it, under practical mill conditions along the line of experimental work. As long as textile manufacturing exists, there will be a constant demand for experiment in certain lines. Every mill represented here at this gathering has its troubles in one branch or another in

its organization. We all know that some of the greatest benefits to mankind, as well as improvements in an industrial line, have been accomplished by men who have constantly applied themselves to research work. One of the things, then, that must be done by the school in the future is to conduct a series of experiments in any and all lines desired by the manufacturer, and send out the results of this research work for the benefit of all concerned. In other words, the school should be not only a place where men can learn humdrum process work, but should, in addition be a source of reference to the whole industry, thereby lending to each individual manufacturer the services of trained men in the accomplishment of any idea desired to have investigated. Thus the manufacturer could look to the school, not only for men who have been trained to apply science and good thinking to any problem arising, but could also receive the benefits of having his own ideas tried out in a practical, non-partisan way.

"In all lines of work it is now becoming the custom to instill into the lives of the young people an admiration and love for the work that they must eventually pursue. Such a feeling of interest is inculcated by teaching rudimentary principles of the science or art to be pursued. This, I think (although not the part for the textile school) should be done in our primary schools connected with mill communities. Teach the children to become better operatives by causing them to study along the lines parallel to the work they are doing, or are going to do, and a greater respect for the industry will be attained in future years. The thing we need more than anything else is a pride and a love on the part of the employee for the industry in which he is to lend his efforts for its upbuilding and maintenance. We cannot love or take pride in anything until we have become familiar with all branches in the make up of that thing. Therefore, if the textile industry is to thrive and prosper, we should first see to it that the men and women, who are to make this possible, should be given a thorough knowledge in the sciences and arts in connection with their work. If this were done then, not only would the industry be on a high plane of moral and industrial preeminence, but the men and women connected with it would become larger, better men and women; and more law-abiding, patriotic citizens.

"You, fellow members of this association, will not be doing your parts as citizens of this great peace-loving nation of ours unless you take an interest in the future upbuilding of the great industry you represent. All of us take pride in the tremendous growth of the textile industry in the South during the last twenty years. We take pride in the number of spindles and looms in operation, and the enormous amount of capital invested in these giant manufacturing plants. But did you ever stop to think that it is neither the money nor the spindles and looms that is to be the ultimate measure of the success of this industry? No! It is not alone these things, but it is the efficiency and moral stamina of the employee that is to cause the textile industry to be regarded in the future as one of preeminent importance.

"What then is to be the means of bringing our work people up to this high standard of efficiency? It certainly cannot be done by leaving them in a state of illiteracy and indifference. They must be educated, not only in the three R's, but in those things which will help them in their daily tasks. They must be taught at least the rudimentary principles of mill work in order to give them a sense of greater respect and admiration for the work they are doing.

"This then is the place the school must occupy in the future. I come to you with a plea, as you love the work to which you have given your lives, to hearken to the voice of destiny and do all in your power to help in the dissemination of this principle. The school is for the work people. It is not only to make superintendents and mill managers, but it is to be a benefit to him who works at his daily task. It is your duty as American citizens to hand down to posterity the things that will cause them to be happier and better. I plead with you thus, because it is you, your influence and your support, that is to make the future of the textile school what it should be."

SOME OF THE TEXAS DELEGATES. LEFT TO RIGHT, WM. HOWORTH, GEO. C. MAY, W. S. MORTON, J. H. HOOK.

This paper attracted much favorable comment and Fred H. White of Charlotte expressed it as his opinion that textile schools should be furnished with a fair sized equipment of machinery by the states in which they are located. "Not two cards but twenty, not five spinning frames but fifty," was the way he expressed it and recommended that the manufacturers go to the state legislatures and demand these properly equipped schools. He further expressed it as his belief that such schools are worth millions to the southern states, and the amount now expended does not compare favorably with that spent to further the agricultural interests. Other members took part in the discussion during which it was brought out that the mills spend, in round numbers, $3.00 for the welfare and education of the operatives to each $1.00 spent by the state. Mr. Rose showed that in some lines the demand for technical graduates exceeded the supply and this steady demand tended to not only increase the supply but also to increase the interest of the pupils in their work. He suggested that it might be well for textile mills to adopt this attitude toward the textile graduates and provide them with places in advance of their graduation.

It was finally decided to appoint a committee of three from each state to take up the matter of increased equipment for the textile schools with the state legislatures and also to urge the need for more free scholarships to be distributed among the young people of the mill communities where it was felt that the need is greatest.

T. B. Wallace of the Dunean Mill announced that he had a position open in his mill for the first young lady designer to graduate from Clemson College. This statement following the suggestion of Mr. Rose.

A vote of thanks was tendered to David Clark for his efforts before the Industrial Relations Commission at Washington. Mr. Clark expressed his thanks and urged that all laws be strictly obeyed.

Hon. W. C. Dowd of Charlotte then addressed the association on

What the Textile Industry Has Done

for the South. Mr. Dowd painted a beautiful word picture of the Old South that brought a reminiscent look into the eyes of the few older men present. He then led the way through the desolate reconstruction period with its awful record, when the persevering work of the ragged and war-worn residents of the South laid the foundation of the present great industrial section; when the indomitable courage of the sons and daughters of the South made the whole vast territory a hive of industry. He quoted statistics to support his statements as to the great growth up to the present period.

He said in regard to the future that in his opinion the textile manufacturing industry is soon to reap the greatest harvest in trade that the world has ever seen. In order to better equip posterity for the immense trade expansion that is bound to come he urged greater educational opportunities for the children of the present. "Get out of the rut," he urged. "Do old things in a new way and do new things that have never before been accomplished." He declared that the tendency of the average human to follow the beaten path had brought on this line of thought and he desired to earnestly urge a change. In order to illustrate this tendency he read the tale of the calf which was so apropos we reproduce it herewith:

One day through the primeval wood,
A calf walked home, as good calves should;
But made a trail all bent askew,
A crooked trail as all calves do.
Since then two hundred years have fled,
And, I infer the calf is dead.
And from that day o'er hill and glade
Through those old woods a path was made;
And many men wound in and out,
And dodged and turned and bent about
And uttered words of righteous wrath
Because 'twas such a crooked path.
This forest path became a lane,
That bent, and turned, and turned again;
This crooked lane became a road,
Where many a poor horse with his load
Toiled on beneath the burning sun,
And traveled some three miles in one.
And thus, a century and a half
Trod in the footsteps of that calf.
The years passed on in swiftness fleet,
The road became a village street;
And this, before men were aware,
A city's crowded thoroughfare.

And soon the central street was this
Of a renowned metropolis.
And men two centuries and a half
Trod in the footsteps of that calf.
Each day a hundred thousand rout
Followed the zigzag calf about;
And o'er this crooked journey went
The traffic of a continent.
A hundred thousand men were led
By one calf near three centuries dead.
They followed still his crooked way,
And lost one hundred years a day.
A moral lesson this might teach,
Were I ordained and called to preach;
For such a reverence is lent
To well established precedent.
That men are prone to go it blind
Along the calf paths of the mind,
And work away from sun to sun
To do what other men have done.
They follow in the beaten track,
And out, and in, and forth, and back,
And still their devious course pursue,
To keep the path that others do.
But how the wise old wood gods laugh
Who saw the first primeval calf!
Ah! many things this tale might teach
But I am not ordained to preach.

The next address on the program was entitled

Clean Up the Village

by Capt. H. P. Meikleham. Capt. Meikleham did not discuss his subject from the literal standpoint of the street cleaner and sanitary inspector, but rather from the moral and physical efficiency of the people who reside therein. He declared that a man who drank whiskey, or 8 or 10 Coca Cola's a day, or who was an habitual user of cigarettes, could not be 100 per cent efficient; that the keen competition in the textile business was daily calling for clearer brains, more energetic muscles, and a higher order of human efficiency; and that this high efficiency was impossible of attainment unless the greatest care be taken to keep the mind clean and the body unimpaired. He urged the gradual elimination of men who were addicted to the habits named, from actual work in the mill as it would increase the efficiency of the mill and improve the morale of the mill workers. He indicated that the old school mill men overlooked these things and that "booze", "dopes", and the results, were all a part of the day's work, but that such beliefs belonged to the old school and hold no place in the present day scheme of mill economics.

At the close of his address which was listened to attentively by those present, W. R. Lynch offered a resolution urging total abstinence among all mill workers in every capacity. This was seconded by Capt. Meikleham and passed unanimously.

A vote of thanks was given to Alonzo Iler, chairman of the arrangement committee, for the very efficient service rendered the association.

The paper by E. M. Holliday was read by title only

as he was unable to attend. Extracts from this paper follow:

Why a Finisher.

"In the organization of all cotton manufacturing companies, especially with those who have weave mills it is necessary to have a practical superintendent, and he in turn must have first-class overseers. He employs the best carder that the salary will allow, for he realizes that he must have good carding. His spinner must be a first-class man also. Next in importance for good results is the dresser or weaver. Then the mill is ready to sail on the manufacturing sea, flying the banner of success, and ready to meet all competitors for the sale of a first quality goods, made by a competent set of overseers carefully selected. Has anything been overlooked? Yes, he needs some good fellow to look after the cloth room. Well, he will advertise for a fellow for this job. Most anybody will do, so out goes the ad: 'Wanted—A first-class cloth room overseer, must be a good manager of help, must write a good hand, married man preferred. Will pay $1.50 for the right man.'

"Now, gentlemen, right here is where I want to say that your overseer of finishing or cloth room must also be a practical man. Why should he not, with your goods properly made by first-class men in carding, spinning, or weaving, has not your finisher to pass on its quality before you can sell a yard of it? Who assumes all responsibility for a mill's product? Your finisher does it. If he accepts seconds as firsts and ships them as firsts he assumes all responsibility, and when kicks and cancellations begin to come to the office he is 'jacked up' for not knowing better. He must be a man thoroughly competent to judge imperfections all along the line from carding to finishing, and must also know finishing to keep your mill running. It does not matter how perfect you can make a piece of cloth, if you do not give it a perfect finish you will not sell it, (I am speaking of colored goods at this time) but you can make an inferior piece of cloth and properly finish it, and will be able to sell your product while your neighbor with a poor finish and a better piece of cloth is short on orders.

E. M. HOLLIDAY.

"A finisher, gentlemen, is born and not made, and not like other overseers, can get his information from books and his brother overseers, ask questions through textile journals, and get answers by the next mail. Your finisher must be on the job *now*, and not yesterday or tomorrow but *now*. He must be ready at a moment's notice to change, for as conditions change, he must also. Not at all times will the same goods finish as they did a week ago, no, or a few hours ago. By sight and a sense of touch the finisher works, and not by any fixed rule, as other overseers may have. Your finisher is your sole dependence at the final inspection of the product produced by all other overseers. It is he who carries the load of duty between the manufacturer and the buyer. It is he who keeps your mill running as much so or more than any other overseer, and in your discussions of mill men and mill problems, don't forget that you have a silent partner in your finisher, one who carries the load of *traitor* because he contends for first quality cloth, one who stands *condemned* because he is not afraid to do his duty, and again the one, I am sorry to say, who is considered an enemy because of a rigid inspection of cloth, for on his judgment very largely depends the progress of your mill.

"We finishers are part of the manufacturing industry. The most of us are human, and we come to you asking that we not be forgotten entirely by you, for by our efforts, we are putting finished goods on the market that will sell, so as to get the money to pay your salary, and if we are not doing this, then, *why a finisher?*

"White or brown goods mill men have their product here today, but it is not as it *came from the loom*. It had to be finished before you would wear it. Brown goods mills are a necessity, but ninety per cent of them depend on a finisher somewhere before their goods are salable. I know of a mill that had to send a man to New York City to inspect some goods that had been shipped there and held up on account of imperfections. Whom did they send—carder, spinner, weaver? No, the cloth room man was sent. Why? Because he had accepted and shipped them as firsts, but they would not pass. This poor fellow, no doubt, was afraid he would hurt feelings. In closing I want to read you a selection that expresses the thought nicely:

"If with pleasure you are viewing any work a man is doing, if you love him or you like him—tell him now. Don't withhold your approbation till the parson makes oration as he lies with snowy lilies o'er his brow. For no matter how you shout it, he won't really care about it; he won't know how many tear drops you have shed. If you think some praise is due him, now's the time to slip it to him for he cannot read his tombstone when he's dead.

"More than fame and more than money is the comment kind and sunny, and the hearty warm approval of a friend. For it gives to life a savor, and it makes you stronger, braver, and it gives you heart and spirit to the end. If he earns your praise, bestow it; if you like him, let him know it; let the words of true encouragement be said. Do not wait till life is over, and he's underneath the clover, for he cannot read his tombstone when he's dead."

Another paper on this subject was read by Mr. Hocking.

Robert Bowe of the Exhibit Committee made the following announcement concerning the November exhibit:

The time limit of the exhibit has been changed and will extend over a period of five days, November 2nd to 6th inclusive. The following special days have been provided: Tuesday, November 2nd. President's and Treasurers' day. Wednesday, November 3rd. College day. Thursday, Friday and Saturday, November 4th, 5th and 6th. Southern Textile Association days.

The exposition will display exhibits in four departments:

A—Exhibits of machinery and mill supplies.

B—Exhibits of cotton fabrics and finished products.

C—Exhibits from textile colleges and welfare departments.

D—Government exhibit of South American fabrics.

The exposition is a "mutual enterprise." Space will be allotted for machinery and supply exhibits in sections six feet wide and eight feet long at a price of twenty-five cents per square foot; space for cotton fabrics exhibits

AT GROVE PARK INN. LEFT TO RIGHT, FRANK W. GURRY, GEN. MGR., POST CITY, (TEXAS) COTTON MILLS; D. H. WALLACE; GEO. F. BAHAN.

will be allotted in sections five feet wide and eight feet long at a price of ten cents per square foot. These prices cover the floor space and railings; special decorations, furniture, power, motors and other requisites will be furnished by the Committee at nominal prices. Any funds over and above all expenses will be rebated on a pro-rata basis.

The Exposition should be seen by everyone connected with the textile industry. Admission will be as follows:

Members of the Association upon registering will be furnished badges, which will admit them at any time.

Members may register ladies and secure special badges which will admit them at any time.

Exhibitors will be allowed two season tickets for each section of space.

Season tickets will be sold at fifty cents each.

General admission tickets will be ten cents each.

All badges and season tickets will be non-transferable.

Then came the election of officers which resulted as follows:

President, W. M. Sherard, Williamston, S. C.

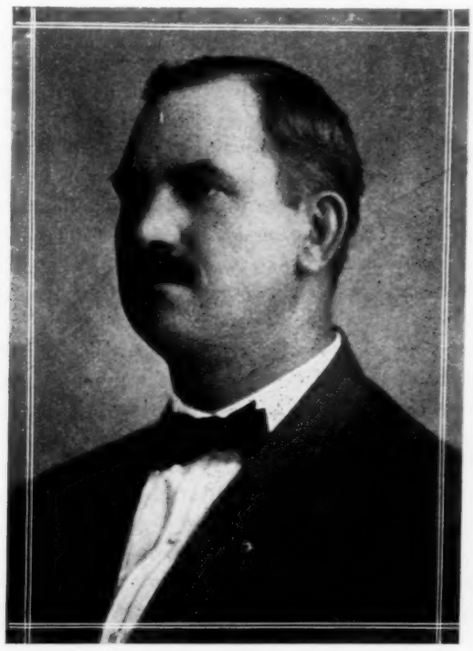
Vice-president, F. E. Heymer, Alexander City, Ala.

Treasurer, Marshall Dilling, Siluria, Ala. (Re-elected)

Secretary, A. B. Carter, Greenville, S. C. (Re-elected.)

Stenographer, Miss M. G. Cranford, Charlotte, N. C. (Re-elected.)

Chairman of the Board of Governors, Robert F. Bowe, Greenville, S. C



W. M. SHERARD, THE PRESIDENT-ELECT.

New members of the Board of Governors: C. L. Chandler, A. M. Dixon, W. S. Morton, L. H. Brown, and F. Gordon Cobb.

President T. H. Rennie of the Pell City (Ala) Cotton Mills, who was on the program, was unable to attend.

Retiring President E. E. Bowen was presented with the gold association medal for service. Hon. W. C. Dowd of the *Textile Manufacturer*, Charlotte, making the presentation for the association.

The Resolution Committee reported and the report was adopted.

The question of a place for the next summer convention was deferred until the November meeting. The formal meeting was then adjourned

Saturday afternoon was devoted to an automobile ride to the top of Overlook Mountain, 3,117 feet above the sea level, while in the evening the delegates were entertained by Manager Seeley with a concert in the "Big Room" at the Grove Park Inn.

Everybody says, "'Twas Some Meeting."

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

This month finds the cotton mill situation in the South in a generally satisfactory condition, and an undertone of confidence in all businesses is observable, which would undoubtedly express itself in a very decided way were it not for frequent disturbances and shocks due to the war. President Wilson's conservative policy seems to have calmed the troubled waters, at least temporarily, we hope permanently.

Cotton mill men are still clamoring for dyestuffs, but nobody seems able to move the British lords of the seas. The situation has not materially changed lately except that more American concerns are undertaking to supply some dyes that Germany used to ship to this country.

From information that we have gathered there has been quite an increase in exports since the first of April, and southern mills are figuring very largely in this increase. In April, for the first time since the war began, we sent more goods to other than European countries than we did a year ago. The increase was $7,800,000, South America taking $1,900,000 more, and Asia, $6,100,000 more. This fact naturally presents a question as to what the result will be, should we continue to increase our manufactured trade with neutral countries during the remaining months of this year, while supplying Europe with foodstuffs, and sending millions of dollars' worth of war munitions.

The Chinese delegation now visiting this country, with a view to bringing about closer commercial relations between the United States and China, is interesting cotton mill men all over the South. They feel that this is a very fine opportunity to expand their trade, and are not failing to cooperate with this delegation in an endeavor to bring about the desired result. For several years past southern manufacturers have been discussing the possibilities of the Chinese market, and looking for ways and means to accelerate and enlarge developments of those possibilities. The members of this delegation state that the object of their visit is to encourage the greatest friendliness between the oldest and youngest of republics, both in our dealings as nations, and in the realms of trade.

Cotton mill men talked with recently all seem quite optimistic over business prospects. HUGH PARKS, president of the Franklinville Mfg. Co., Franklinville, N. C., stated that he thinks the business outlook is good, and cotton mill conditions fine. He is very hopeful of a satisfactory adjustment of our differences with foreign countries, and feels very optimistic over conditions in this country. He states that things look better now than at any time since the war began.

CLIFFORD J. SWIFT, vice-president and general manager of the Swift Spinning Mills, Columbus, Georgia, stated that the demand for their product had been constant for the past year. "We have been able to run our mill full time and have accumulated no stocks," he said, "and have orders on file at the present time to keep us busy for several months to come, so we cannot help but feel optimistic regarding the future." This mill makes a specialty of high grade yarns, 5's to 24's.

In talking with ALEX. LONG, president and treasurer of the Aragon Cotton Mills, Rock Hill, South Carolina, he said that he believed any expression in regard to business generally and the future outlook for textile manufacturers especially was merely a guess. "However," said he, "my guess is that it cannot be long before the business of manufacturing cotton goods in this country, both North and South, is going to have a period of great prosperity, and I am inclined to think it is very near at hand, whether the war ends or not, and regardless of whether we have war with Germany."

New mills, changes, additions, etc., are noted as follows:

W. A. Mauney, Hunter Mauney and J. L. Putnam of Kings Mountain, N. C., have purchased the Mariposa Yarn Mill, of Stanley, N. C. They will make extensive repairs, and will start up the mill as soon as these changes and replacements are made. The plant contains 3,264 spinning spindles and 1,600 twisting spindles, which heretofore have been operated on 18's and 30's cotton yarns.

Extensive repairs and improvements are to be made in the plant of the Orangeburg Mfg. Co., at Orangeburg, S. C. The plant is to be closed down for a week or two while this work is being done.

Contract for machinery for the new addition to the mill of the Coosa Mfg. Co., Piedmont, Ala., has been placed. It is to be equipped with 10,000 spinning spindles and 5,000 twisting spindles. About a dozen new operatives' cottages will be erected to take care of the additions to the company's force.

The Cleveland Mfg. Co., Austin, Texas, has been incorporated for the manufacture of cotton goods, the company having a capital of $16,000. The incorporators are J. T. Tanner, T. A. Boothe, and John Griffith.

The Chisca Mfg. Co., at Memphis, Tenn., with a capital of $500,000, is planned for organization to build cotton mill. The promoters are T. R. Kinfield, S. B. Anderson and L. D. Falls, all of Memphis.

The report that the Lang Cotton Mills, West Point, Georgia, would dispose of their weave room equipment has been denied by the management. They are planning to add considerable new machinery.

The Sutherland Mfg. Co., of Augusta, Georgia, have placed an order for new cards and drawing. They now operate about 5,000 spindles, on osnaburgs and ducks.

The Pickens Mills, Pickens, S. C., are planning to install new drawing frames.

The Crown Cotton Mills, Dalton Georgia, have closed contracts for about 20,000 new spindles, with complimentary machinery. The mill already operates 35,000 spindles, manufacturing ducks and osnaburgs.

It is reported that the new Waldensian Swiss Embroidery Co., at Valdese, N. C., will manufacture embroidery and laces, and will import machinery from Germany.

C. S. Butt is reported as interested in establishing a knitting mill at Wilmington, N. C., and is making inquiries for information and prices on necessary equipment.

The Lynchburg (Va.) Chamber of Commerce is interested in the establishment of a hosiery mill at Lynchburg. W. T. Corwith, secretary, is the chief promoter.

It has been reported that the DuPont Powder Co., of Petersburg, Va., has taken over the Ettrick and Matoaca Mills of the Virginia Consolidated Milling Company, and will use the product of these mills in the manufacture of gun cotton. Both of these mills have been closed for some time.

Thos. P. Boone, secretary of the Chamber of Commerce at Johnson City, Tenn., is interested in plan for organizing a $350,000 company to build a cotton mill, and two companies to build knitting mills.

Arrangements are being made to start up the Hamburger Cotton Mills, Columbus, Ga., at an early date. The managers are considering the installation of 8,000 new spindles. Harry L. Williams, president of the Swift Mfg. Co., has been elected president; George S. Hamburger, secretary and treasurer, and Guy Garrard, manager. Tickings, denims and plaids are manufactured.

About September 1st, this year, the new additions to the French Broad Mfg. Co.'s mill, at Asheville, will be completed, and the new machinery will be ready for operation. The new equipment will include 5,000 spindles and preparatory machinery. The capital stock of this mill was recently raised to $750,000.

The Delgado Cotton Mills, of Wilmington, N. C., will erect an addition to their finishing department. This mill operates 10,000 spindles on ginghams and cheviots.

Malone and Keesler of Clarksdale, Miss., are interested in the erection of a cotton pickery. Percy Chamberlain is manager in charge.

Contracts have been placed for the erection of 250 cottages for the operatives at the Pacolet Mfg. Co., Pacolet, S. C. It is estimated that the work will amount to about $300,000.

The Tipton Cotton Mill, Covington, Tenn., is making extensive changes and improvements, overhauling the plant generally, and tuning up the machinery.

D. H. Warlick, secretary of the Dudley Shoals Cotton Mills, is organizing a company to build a 5,000 spindle cotton yarn mill at Granite Falls, North Carolina.

The Berryton Mills, Berryton, Georgia, are planning to increase their capacity by the addition of several thousand spindles. They now operate 7,000 spindles on 16's hosiery yarn.

The Merck-Hetrick Mfg. Co., Gainesville, Ga., expect to double the capacity of their knitting plant in the near future. The present equipment has a capacity of 100 dozen, while the new finishing plant just completed has a capacity of 300 dozen. Hinchman, Vezin & Co., New York, handle the product of this plant.

The Southern Bleachery Co., of Rome, Ga., bleachers of linters for war material, will add another unit to their plant doubling its present capacity.

NEW ENGLAND MILL SITUATION.

Dyestuffs scarcity has become the most serious source of trouble confronting New England cotton manufacturers. Orders for many goods have been declined through inability to secure the colors wanted, and this applies to foreign and domestic business. Some progress is reported in the manufacture of dyestuffs by domestic concerns and it is thought that before the end of this year all danger of a scarcity of blacks will be obviated. Indigoes cannot be had for quantity production. A few days ago leading printers were offered some synthetic indigo at $1.05 per pound, normal price before the war 15 cents, and the stock was held at Shanghai. So far as could be learned it was not purchased as the amount offered was too trifling to consider.

The leading printers of indigo goods have exhausted their supplies and sold their stocks of goods. They are now refusing further business and a few buyers are becoming anxious. The manufacturers of indigo blue denims are steadily using their limited supplies and two or three instances have come to light of manufacturers having taken orders for goods in excess of their ability to furnish indigo for them. Fast reds are not being offered in printed goods save from second hands.

The demand for goods of gingham construction have been restricted this year in comparison with a full season and that has served to make stocks last longer than in the case of other materials. The shutting off of all orders for dark ginghams by leading mills has also enabled them to offer many fabrics in lighter dyes or in combinations of color that will serve to make fast colors last longer than was expected a short time ago. The ticking business has not been pressed at all so that dyes are in hand for lighter cloths that will show a more satisfactory profit.

One of the leading exporters of prints has more than 20,000 pieces on order which printers have hoped eventually to fill. There has been no attempt to cancel the business as the dyestuffs problem is world-wide and Manchester is feeling the pressure even more than the converters and printers in this country.

The leading finishers have issued a statement prepared by a committee of their number in which they deal with the present situation exhaustively. Despite the hopefulness expressed by them and some others, it is known that the largest users of dyes in New England anticipate a very general closing of plants by November unless more rapid progress is made in getting colors in the meantime. One feature of importance is that all users of colors are now advancing prices for the purpose of putting their costs on a safer basis. It is manifest that replacement costs are going to be large for a long time to come and prudent manufacturers are foreseeing the time when higher finishing and dyeing charges will have to be made. It was pointed out in a large Massachusetts print works last week that if charges were imposed today in keeping with costs, many goods would be at least ½ cent a yard higher.

Many influences have been at work to prevent buyers from manifesting interest or anxiety in the dyestuffs problems of manufacturers. One emanated from German chemical companies whose agents sought to discourage domestic production, not only to save their immediate business in this country, but from other causes. Then again, many manufacturers in this country hesitated to bind themselves to use domestic products for any certain period, on the assumption that when German shipments were resumed prices would be below the domestic levels. Such a thing as patriotism in the establishment of an American dye making business was scouted from the inception of the scarcity. Another was the wide circulation given to the idea that all the color talk in this country was part of a plan to impose again upon the country a higher tariff on dyestuffs, which buyers of goods would be called upon to pay.

More intimate influences, and not so closely related to manufacturers were the following: Buyers of goods have seldom been known to anticipate purchases of anything until they began to see signs of reselling at a profit. They will buy cotton goods if cotton shows a tendency to go higher, but in part they think that will bring more wealth to the farmer and to others interested in cotton. But they have seen nothing in the dye scarcity to make them think that users of goods will be in a hurry to purchase until they actually run out of supplies. Another influence against anticipating has been the pressure of financial heads of houses to hold down stocks of goods to actual requirements based upon day to day sales. Even where skilled buyers have foreseen scarcity and higher prices on colored goods, they have not been able to act on their judgemnt while merchandise managers have been pressing them to keep their stocks of merchandise at a minimum.

But whatever buyers of goods or others may now say, the fact is clear that New England manufacturers are troubled by the dyestuffs scarcity to an extent that compels them to decline business. The question of how far consumers of goods will aid in the readjustment of distribution, arising from the scarcity of dyestuffs hitherto used, remains to be answered. One of the interesting events of the month was the announcement made by the largest manufacturers of blue denims in the country, the Cones of North Carolina, that they would close their White Oak and Proximity plants August 1 for an indefinite period. It is known in the markets that they and other manufacturers of standard denims have been offering cloth dyed with colors other than indigo. The cloths themselves are as good or better than those usually dyed with indigo. But buyers have not taken them freely enough to keep the plants in operation. What they will do when there are no more to be had in indigo remains to be seen. It has certainly impressed the manufacturing world to know that the Cones, the largest users of indigo in this country, cannot get the dyestuff, but why it hasn't impressed cloth buyers is a mystery.

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The bleached goods situation has ruled about steady all the month. Contrary to the experience of most years there was no break of any consequence in jobbing prices all during the six months and stocks of the best known branded lines of bleached cottons in first hands are meagre. For this reason no decline is anticipated such as was seen in gray goods, nor will any advance be pressed at the beginning of the fall season.

The bleacheries were not as active in June as in May or in April yet some of them are still fully employed, and the larger ones are finding no cause for complaint in limited operations after such a busy time. The mills as a whole are very much better employed than they were a year ago. There is some improvement among the machine shops and it is due more to replacement of old machinery than to investment in new plants. The probability that the cotton machine shops may be called upon to pass on opportunities to make munitions or gun parts has been much talked of and it is known that offers of moment have been under consideration.

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The yarn market for the past month was somewhat spotty, but has been a fairly good one all things considered. Early in the month spinners made it plain that they were not inclined to make further price concessions on carded knitting yarns. The buying was not active and there was little improvement in this line or in combed yarns. Prices of mercerized yarns continued very strong. There was no material change in the weaving lines for the last month and little change is looked for until later in the year.

Later in the month there was a good demand for carded knitting yarns for prompt delivery. There were a few sales of ten thousand to fifty thousand pounds for future delivery and one sale with deliveries running into next year was made on the basis of 16 cents for 10's. Other sales of deliveries beginning in July were made on the basis of 15, 15¼ and 15½ cents for 10's. Eastern mule spun carded cones were sold on the basis of 17 and 18 cents for 10's, but there were no large sales made. There were some inquiries in the market for single and two-ply combed yarns for late deliveries. Offers of 20 cents on a basis of 10's for southern single combed peeler on cones were received. This situation is rather a peculiar one inasmuch as southern single combed yarns are rather irregular in prices and some spinners are holding for prices a cent and a cent and a half above what others will sell for and are getting their prices for small quantities. Two-ply combed yarns are well sold and spinners are in a position to hold for a profitable price in many instances.

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Southern Single Skeins.

8s	14 @15	10s	14½ @15
14s	15	16s	15 @15½
20s	16	24s	17
26s	17½ @18	30s	20 @20½

Southern Single Warps.

8s	14 @14½	10s	14½
12s	14½ @15	14s	15
16s	15½	20s	15½
24s	17½ @18	26s	18 @18½
30s	20 @21	40s	25 @27
50s	34 @34½		

Carpet and Upholstery Yarns in Skeins.

9-4 slack	16½	8-4 slack	16
8-3-4 hard twist	13½ @14		

Southern Two-Ply Skeins.

8s	14	10s	14 @14½
12s	14½ @15	14s	15
16s	15½	20s	16½ @17
24s	17½	26s	18
30s	18½ @19	40s	25½ @26½

Sothern Two-Ply Warps.

8s	14	10s	14½
12s	14½ @15	14s	15 @15½
16s	15½ @16	20s	16¾ @17
24s	17½ @18	26s	18 @18¾
30s	19 @19½	40s	26 @27
50s	34 @35		

Northern Two-Ply Carded Peeler Skeins.

22s	21 @21½	26s	22 @22½
30s	23½ @24	36s	24 @25
40s	27 @29	50s	35 @36

Two-Ply Combed Peeler Skeins.

20s	24½ @25	24s	26 @27
30s	28 @30	40s	34 @36
50s	38 @41	60s	45 @50
70s	53 @55	80s	61 @63

Southern Frame Spun Yarn on Cones.

8s	15	10s	15 @16
12s	15½ @16½	14s	16 @17
16s	17 @17½	18s	17½ @18
20s	18 @18½	22s	18½ @19
24s	18½ @19	26s	19 @19½
30s	20 @20½		

Northern Mule Spun Carded Yarn on Cones.

10s	17½ @18	12s	18 @18½
14s	18½ @19	16s	19 @19½
18s	19½ @20	20s	20½ @21
22s	21½ @22	24s	22½ @23
26s	23 @23½	30s	23½ @24
40s	25½ @26½		

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	22 @22½	12s	22½ @23
14s	23 @23½	16s	23½ @24
18s	24 @24½	20s	24½ @25
22s	25 @25½	24s	25½ @26
26s	26½ @27	30s	29 @30
36s	32 @34	40s	35 @36

THE KNIT GOODS MARKET.

Knitting mills in Philadelphia and the eastern Pennsylvania territory are taking yarns more freely than a few months ago. While this is true of mills engaged on underwear, it is a more striking reflection of the greater activity in hosiery. The trade reports a brisk market, retail dealers buying with less conservatism than has prevailed. Jobbers are booking a fair volume of advance business, and little uneasiness is manifest except as to dyes, particularly black.

Cotton is coming to its own in hosiery since the sharp advance in artificial silk. The prediction is made that if the price boosting on fibre silk continues, there will be a healthy return to mercerized cotton, which for a time has not been in general demand.

Mills selling their output through New York agents and commission houses are in receipt of encouraging reports, notably from the middle West, where, in addition to buying in better quantity, dealers in many instances, are anticipating their acounts. From mills and wholesale distributors come the most stimulating reports that have poured in for many months. Considerable export business is being taken, for both the French army and the civilian trade of the nations allied in the war against the Austro-Germanic countries.

Notwithstanding knitting machinery in the main is well employed, mills and their agents speak of business as unsatisfactory, and the same sentiment is heard in the jobbing trade. When pressed for specific statements as to unsatisfactory conditions, the explanation invariably hinges upon the dye stringency and the uncertainty as to future supplies. Dealers, however, admit that they are having little trouble with deliveries.

It is apparent that the seriousness of the color problem has not been exaggerated. In the last few weeks the National Association of Hosiery and Underwear Manufacturers has issued several special bulletins relative to forthcoming demonstrations to be had in a nearby establishment of a new fast black being brought out as a result of two years' research by W. P. D. Aims, a Philadelphia chemist. While the association does not stand sponsor for any of the claims made for the new black, it is being deluged with letters from hosiery manufacturers in all parts of the country asking for information. Back of Mr. Aims is H. Berendsen, of the Bangor (Pa.) Silk Knitting Company, Inc., and N. A. Litchfield, a Bangor capitalist heavily interested in such enterprises.

Letters from a number of mills relative to the new black state that unless dye can be obtained shortly, they will have to shut down. At least one mill is going out of the heavy weight business, because of the higher cost of black and the greatly increased cost of his production, the heavier goods consuming so much more dyes than light weights. There seems to be no doubt that assurance of a supply of fast black would materially stiffen manufacturers of hosiery and stimulate production. At the present prices of cotton yarn, it is asserted, mills able to finance operations for the future would be safe in accumulating stock.

The demand for cotton-woolen hosiery and cotton underwear for export has enabled a great number of mills to survive the unusual trend toward fibre and artificial silk. For the allied armies dealers are contracting for cotton-wool mixtures, the per cent of wool required varying from 40 to 60. Two orders for 90,000 and 120,000 dozens, respectively, their authenticity attested by the French seal, are shown by an agent scouring mills in this territory for the goods. Recently agents have toured the underwear manufacturing centers of the state taking about everything in sight in worsted lines for export.

In response to the brisk demand for knitted goods, new mills are coming into existence and many old establishments are revamping or adding to their equipment, all of which is deplored by the more conservative element in the trade. The increased mill capacity, it is argued, means that sooner or later there is going to be a surplus to be dumped upon the market at disturbing prices. Wails of this character are heard with every spurt of enterprise and whenever an innovation is attempted. Usually the prophecy miscarries, and the optimist of today believes it will miscarry in this instance. It has been demonstrated that there is a shortage of cotton goods. Not only must this be met, but the promise of a better buying power carries asurance of increased consumption, for which preparation must also be made. In any event, more cotton yarn is going into manufactures than for many months, and those who venture a prediction that a sudden change for the worse is imminent are in a small minority.

Reverting to cotton's struggle for supremacy in hosiery, jobbers are showing half hose and women's stocking made of fibre and thread silk twisted, the combination providing a yarn of fine lustre. These goods are made to retail at

50 cents, and in the short time they have been on the market have won considerable favor. A factor favoring this class of production is the high cost of dyestuffs, the lighter yarns absorbing less of the color and, therefore, being not so appreciably affected as to cost as are fabrics knitted from the heavier yarns.

There seems to be no question that the color situation is being used for unwarranted price boosting, while it is responsible also for inferior production. A Philadelphia jobber recently returned a large consignment of bandanna handkerchiefs for no other reason, he said, than the unpleasant odor from the dyeing material. "The smell," he said, "was positively nauseating. And to make matters worse," he added, "we were charged 35 cents a dozen for these bandanas of inferior dyeing, as against 18 cents when we placed our last previous order."

COTTON MANUFACTURING.

CARDING AND FINISHING ABSORBANT COTTON.

BY WILLIAM B. NANSON.

After absorbent cotton stock has been bleached and dried it is better to bale it up and allow it to age, if possible for several weeks, before carding it. If this cannot be done it may be blown into a bin in the mixing room, convenient to the openers and lappers and mixed in the correct proportion required by the formula in use; for instance, it may be three parts comber waste to two parts cotton pickings, or two parts combers, two parts willowed fly, and one part linters, or again it may be two parts 62 per cent strips to three parts linters, etc., *ad infinitum*.

These different stocks should be carefully laid in layers in the mixing bin on top of each other, each layer to be laid evenly all over the one underneath, for instance, in the case of the first formula mentioned it would be three bales (or their equivalent) of comber waste laid out, then two bales of cotton pickings, then three bales of comber waste, then two bales of cotton pickings, until 50 or 100 bales had been laid in the pile. To use this, the stock should

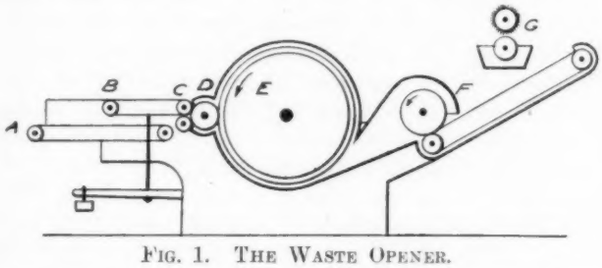


FIG. 1. THE WASTE OPENER.

be raked off from the side with an iron toothed rake, taking care to rake the pile thoroughly from top to bottom so as to thoroughly mix the whole stock together. These rakings should then be run through a waste opener such as is shown in Fig. 1.

This is a good, strong, substantial machine and is in general use in the older countries. The cotton is fed onto a 24-inch lattice *A*; it passes under an iron collecting roller *B* to the feed rolls at *C*; these rolls must be both fluted and chased and rest on sixteen weighted levers or pedals, these latter being turned up at the ends so as to firmly grip the cotton close up to the licker-in *D*; the cylinder *E* is very strong and is formed of an iron body, to which wooden legs containing hardened and pointed steel pins are firmly attached; this cylinder is 24 inches in diameter. The cotton is beaten from the feed rollers and levers by the licker-in, and so on to the cylinder, turning in the opposite direction, and is then passed out of the machine by means of a lattice and a revolving cage *F*, or if desired, it can be blown to the feed box of the breaker lapper. The production of this machine is about 130 pounds per hour. It will take two of these machines to feed one machine in the next process.

A soaping arrangement may be attached to the waste opener at *G*. The object of this being to constantly spray softened water upon the opened stock as it is passing up the delivery lattice. The softened water is run into a trough which contains a wooden roller partially immersed in the water; this picks up some of the water as it revolves and is as continuously brushed off in a fine spray by a brush rapidly revolved from the cylinder, the water spraying on the stock. This water (or soap and water if desired) prevents the stock from flying about, takes the electricity out of it and makes it card easier, besides adding to the weight and absorbency of the cotton, for it must be remembered that absorbent cotton at this stage of its preparation is very dry, fluffy and dusty, and is difficult to card without the addition of artificial moisture.

The next operation is to form the lint into laps for the cards. It must be remembered here that absorbent cotton needs no cleaning and should go through the lapper with as little beating as possible and the lapper should be fitted with an automatic feed regulator to produce laps as even as possible without doubling, for I advise only one process of picking—a single beater lapper with automatic hopper feeder and guage box or feed regulator, making a lap weighing 12 ounces to the yard. Having prepared the lap we will now consider the best method of carding it into the necessary fleece.

Various types of cards are used on this stock, the most universal being the full roller or English roller and clearer card, but the revolving flat card is the best in the opinion of the writer. The size of the wire is the essential point; it should not be fine, numbers from 60's to 90's will give the best results.

When carding absorbent cotton there are two systems which may be employed: the short system by which a sheet of wadding may be made upon a single card; and the long system by which a full set, or line, of cards in number from 12 to 16 may be used. The former is convenient for small installations or for making varying quantities of absorbent cotton, but compels the manufacturer to make a roll of cotton of one uniform quality or mix throughout, while the long system enables him to make a roll with a better exterior finish or quality than that of which the interior is composed. Moreover, the process is a continuous one and

there is a constant web of cotton coming off the line, while in the short system a considerable loss of production is incurred by the frequent stoppings of the lap drum while the full laps are being removed, and its operation is accompanied by irregular work and much consequent waste. The necessity for doing this frequently makes the card an intermittant machine, and a carding engine, to do good work, must be a continuous worker. However, as the short system is the one usually employed in Europe we will give it here.

The fleece is prepared upon a full roller or English card at the delivery of which is fitted a fleece drum 28 inches in diameter as shown in Fig. 2.

The web from the card is wound around this drum until the required thickness is run on, usually about 8 ounces.

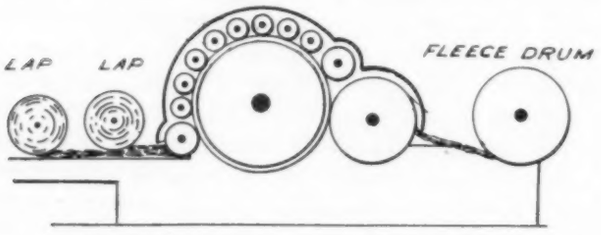


FIG. 2. THE CARD AND FLEECE DRUM.

The fleece is then cut off the drum longitudinally and forms a sheet some 90 inches in length and 36 to 43 inches wide. This sheet is then taken to the winding machine, Fig. 3, laid on the table at the back of it and wound onto a spindle with paper interleaving. The spindle on which the lap is wound is split and in this opening the paper and the lap are

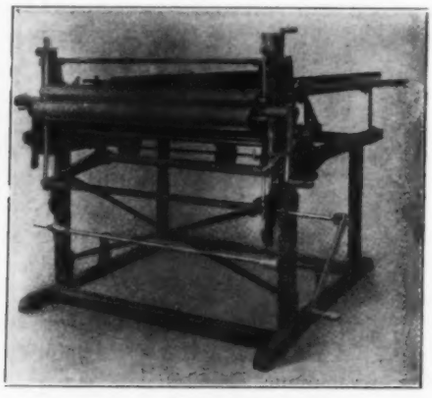


FIG. 3. THE WINDING MACHINE.

inserted and wound up together. This is done by hand and the lap and paper are pressed under a compression roller, which gives an equal pressure throughout the operation and winds the package up tightly. The long roll thus obtained is transferred to the cutting machine Fig. 4, where it can be cut into sections of any length under a horizontal blade.

In the long system, either the roller and clearer or the revolving flat card may be used, but the writer is inclined toward the latter for the following reasons: It is more economical, there being a saving of about one-quarter of a cent per pound in the production of the web of cotton, there is less handling of the work, there is less piecing, less waste, less oil, less belting and careless and indifferent help to look after. A greater carding surface is obtained, and the material is therefore cleaned better. The flats are ground and stripped while at work, and they can be set closer than other cards and close setting is the parent of good work and little waste.

As regards the roller and clearer card, it is claimed in its favor that it is simple in construction, is easily set and not likely to get out of adjustment or order, (which is not the writer's experience with it) and that it accomplishes a more open treatment of the cotton fibres and turns them over and mixes them better. There is no question of the

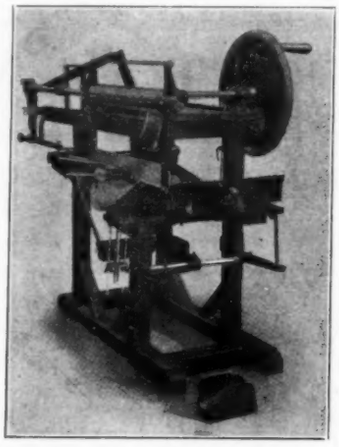


FIG. 4. THE CUTTING MACHINE.

truth of this latter claim, and to any lay observer watching the roller card at work, it will be made quite obvious to his understanding that the treatment to which the cotton is subjected is exceptionally severe and any practical man, knowing exactly what is required in the case of absorbent cotton, is at once driven to the conclusion that the violence is in excess of all requirements. However, it takes experienced labor and more of it, the rollers and clearers have to be frequently stripped by hand, and must often be ground up and brushed out. This entails the frequent stoppage of the card and it takes two men to lift them in and out, damages the cards, and crushes down the wire with careless handling. The quality of the work as regards cleanliness and smoothness is, in my opinion, inferior to that of the revolving flat card. As regards leaving the fibres in parallel order, the roller card has much to be desired. The transfer of the fibre from cylinder to worker, from worker to clearer, and from the latter again to the cylinder and so on through the whole series to the doffer, is not conducive to the disposition of the fibres in parallel order. The alternation of surface velocity between the slow-going roller and swift-running clearer and cylinder will have a tendency to fold the fibres back upon themselves, and each roller as it delivers its carded portion to the cylinder will more often lay them in lines not parallel to, but contrary to their proper direction. The result, therefore, is only an indifferent approximation to the parallel condition. We shall, therefore, in this present paper, confine our attention solely to the action of the revolving flat card, though in a general way the remarks are applicable to the roller card as well.

Before going further I will say that there are people in the cotton batting and absorbent cotton business who think that any old worn out card will answer, and who will buy any old junk to manufacture cotton batting, thus handicapping themselves from the start. Setting aside the fact that the revolving flat card will do more work than any such second hand trash and will do it better,—it will do it at a cost of from one-quarter to one cent a pound

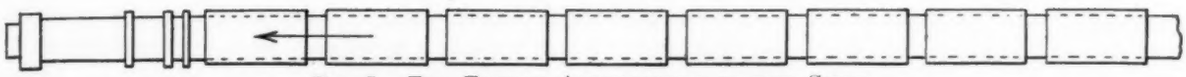


FIG. 5. THE TANDEM ARRANGEMENT OF THE CARDS.

cheaper, and this alone will pay a 20 per cent dividend on the investment.

Having decided to put the revolving flat card into the mill, I would advise an arrangement as in Fig. 5. In this method fourteen 40-inch cards are placed tandem, straddling an endless leather apron inside of a wooden trough. The calender rolls and coilers are dispensed with and the web from the doffer drops onto the apron which travels at a speed of about 45 to 60 feet per minute and carries it to a drum head or header lap machine, where the combined web from the fourteen cards is rolled up and made into a lap. Now we shall only feed the product of thirteen cards onto this apron, because it is our intention to always keep one card grinding and as we want each 14 feet of web to weigh exactly 7,000 grains we shall proceed as follows:

Each of our fourteen cards will be provided with a double lap rack, so that we can put up two 12-ounce laps, tandem, on our feed; which will make a 24 ounce lap for a feed; this, with a draught of 90 on the card will give us a web of 116 grains and this multiplied by 13 cards and divided by 3 to get the total grains per foot multiplied by 14 feet equal $116 \times 13 \div 3 \times 14 = 7028$ grains or to roll the web up at full width, 36 inches wide, or it can be made to fold the web upon itself three times into a narrow web 12 inches in width. It is customary to take the web from the drum head and rewind it on another machine, as previously described, but the writer has invented a machine that will wind the web up and interleave it with paper as it comes off the apron from the cards without any second handling, which will be described further on.

In carding absorbent cotton, especial care must be taken that there is only sufficient overrun between the lap roll and the feed roll, and between the doffer and the travelling apron to take up the slack, any excess of draft will cause the lap or the web, if composed of short or previously worked fibres of waste, to pull apart and make thick and thin places and a cloudy web. If the doffer is set too far away the result will be a cloudy web. The speed of the main cylinder should be 170 revolutions per minute and the production from each card about 1200 pounds per week.

For carding absorbent cotton it is best to add a fancy roller to the card. This is a roller that overruns the periphery of the cylinder, its object being to prevent the cylinder from choking or loading. This roller runs at a high speed, and practically raises a nap of cotton on the cylinder surface, so that the doffer will afterwards take the cotton from the cylinder in an efficient manner. Its long wires should penetrate those of the cylinder from 1-32 to 1-16 inch deep. This roller should be applied immediately over the doffer and increases the doffer's efficiency very materially. It is wholly beneficial when heavy carding and a big production is demanded, as it does away with frequent stripping of the cylinder, and the card to which it is applied may be run for seven days, or longer, without stripping the cylinder.

Another point of prime importance when carding absorbent cotton is the humidity and temperature of the air in the room. Static electricity is generated by the quickly revolving cards and must be combatted by humidity or the web of cotton will cling to every thing it touches and cause no end of trouble. Some mills place a small perforated pipe under and parallel to the doffer and blow live steam through it. This is objectionable and should not be done. The proper way is to blow live steam into the room at certain distances near the cards, or, what is better, install a system of humidifiers. The humidity should be, dry reading, 84; wet, 79; per cent 76; 9.4 grains of vapor in a cubic foot of air. It is also advisable to operate a lump preventer under the licker-in because bleached stock is apt to give trouble at times with thick, damp, sticky bunchy places.

Absorbent cotton is put up in the following ways: Five-pound rolls for hospital use; one-pound rolls in colored wrapping paper; one-pound rolls put up in cartons; while eight-ounce, six-ounce, three-ounce, and two-ounce lots are put up in cartons only.

If sterilized absorbent cotton is desired, which is seldom the case, as most hospitals prefer to do their own sterilizing, and the so-called sterilized cottons found on the market are usually germ free only in name, it may be done under a 20-inch vacuum in a steel tank capable of holding 2,000 pounds of cotton; the cotton is subjected to a treatment of formaldehyde vapor for about two hours.

Large quantities of absorbent cotton are used in the electrical industry and in the manufacture of incandescent mantles, varnish and all the various compositions of cellu-

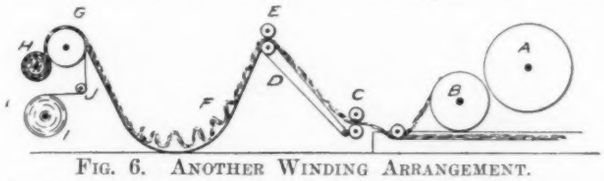


FIG. 6. ANOTHER WINDING ARRANGEMENT.

lose. For most of these uses, a cotton giving the least quantity of ash after burning is to be always preferred. To achieve a perfect result in this direction the cotton should be soured off in the bleaching with a mixture of hydrofluoric acid and water, this is to remove the last traces of silica which can be removed entirely in no other way.

There has been much ingenuity expended in devising means to roll up and interleave with paper the rolls of absorbent cotton as they are finished or as they come off the line of cards. The writer has found the arrangement in Fig. 6 to answer very well. *A* and *B* show the cylinder and doffer of the last card on the line, the web being stripped drops onto the apron in the trough and falling on the combined webs of the other 12 cards completes the full thickness of the web, i.e., 7,000 grains in each 14 feet. It now passes under a gathering or condensing roller and passing between the two steam heated rollers *C*, is carried by the lattice upon *D* through the wooden draw rollers *E* and is dropped in loose folds into the smooth tin scoop *F*. *I* is a roll of paper 11½ inches wide (for pound rolls 12 inches wide); it is threaded under the small tension roll shown, over the iron compression roll *G* and round the spindle *H* where it is wound up with the cotton.

This spindle has a square head fitting into a suitable socket which is driven continuously by a belt working on

flange pulleys, the idea being to abolish the slipping of the belt and save time. All the operator has to do is to thrust the square head of the spindle into the quickly revolving socket, stopping it for just a moment only by the slippage of the belt, while he adjusts the paper and cotton for the next roll. The velocity of the winding spindle being twice the velocity of the web coming from the cards, it is obvious that the operator will have time to take out the full roll of cotton while the scoop *F* is filling up again with 14 feet of web for the next roll. It will take a skilful operator, of course, but there is no reason why he cannot keep up with the cards and make no stoppages. The spindle *H* is stationary, that is, it remains on the same center, but the compression roll *G* rises as the spindle fills. A dog knocks off when 14 feet has been rolled and cuts the lap and paper. The spindle is then pulled out and the finished roll drops into a slanting trough in front of the spindle down which it rolls onto a table to a girl, who tickets it and puts it up. The capacity of this machine is the capacity of the line or about 2,500 pounds per day. The capacity of the rolling machine shown at Fig. 3 is 600 pounds per day.

TOILETS AND QUILTS.

BY FRED W. HORROCKS.

The manufacture of toilets and quiltings is carried on principally in Bolton, though there are mills dotted about the country which also produce some very beautiful colors for both furniture and bedroom purposes. The quilt and toilet trade is a quite distinct branch of the fancy weaving industry, having its own particular prices and wages lists. There is also a very great difference between the arrangement and requirements of an ordinary plain or fancy-weaving shed and a quilt shed.

Not only is the quilting works a collection of all the most ingenious machinery invented, but the frequent alterations made to suit the chances and changes of the market necessitate the employment of a larger staff of men than is the case in any other class of weaving.

Toiletings and quiltings are cloths in which the pattern consists of a loose cloth floating over the ground cloth. These figures may be floral or geometric, or may take the form of names of steamship companies, hotels, etc.

For these cloths two warps of different counts or colors, or both, are required. There are often two counts or colors of weft required.

The looms to weave these cloths are, of course, of various widths, ranging from narrow toilets of 30 inches, to broad quilts of 120 inches. Taking for consideration, first, the narrow toilet loom, it is sometimes a single box and sometimes a double box jacquard loom. It has a 400 hook single lift jacquard machine, generally arranged "London" tie—that is, with the cards at the side of the loom, as in Lancashire mills. This is the most convenient method. The jacquard harness is tied up so as to weave both the centre and the border of the cloth. In most cases there are four picks to each card, though five, six, eight and ten picks to a card are sometimes made. For a four pick toilet the required hooks are raised for two picks together, and then they are dropped for two picks.

The comber board of the jacquard harness is in two parts, front and back, and each half is raised for one pick out of four. Each jacquard thread is formed so as to have a very large knot immediately over the hole in the comber board through which it passes, so that when the half boards are raised the ends of the yarn are raised. The ends operated by the jacquard machine are from the back or lower warp, and are for the back of the cloth, whilst the ends from the top or face warp are for the pattern or face of the cloth. In front of the jacquard harness are two healds, or four healds coupled. These are for the face ends, and weave the plain cloth that stands up over the ground of the fabric. The whole harness is therefore known as a "compound" harness, the ends of the yarn being controlled by means of the jacquard machine, comber boards and healds. The comber boards and healds are operated by means of a revolving wooderoft tappet placed at the side of the loom; two of the plates of which govern the healds, and two plates govern the comber boards. The healds are operated positively by means of top and bottom jack levers, as is also the case with the comber boards.

There are various orders in which the healds, machine and comber boards are raised, the four pick toilet often being arranged as follows: No. 1 pick, lift jacquard griffe and No. 1 heald, for face; No. 2 pick, jacquard griffe still up and No. 2 heald, for face; No. 3 pick, jacquard griffe down, both heald up, and No. 1 board up for back pick or wadding; No. 4 pick, jacquard griffe down, both healds up, and No. 2 board up for back pick. The purpose of the comber boards is to insure the binding in of all the back ends into the fabric; loose back toilets, a cheaper sort, are not woven by means of these rising comber-boards.

Some toilet looms are double box, having one weft for the face cloth, and a much coarser weft for the back or ground. In most cases these cloths require the two drop boxes at only one end of the sley, as the picks are inserted in twos, viz.: Two picks fine, and two picks coarse. When weaving cloths "pick and pick," that is, one pick fine and one pick coarse alternately, double boxes are required at both ends of the sley. These boxes are operated by means of a Diggle's chain box motion, a compact arrangement, in which a chain having two different sizes of links acts upon a lever connected with the shuttle boxes so as to raise them or allow them to drop every two picks. This box motion is of the negative type, and the boxes drop without the aid of springs.

The warps are different in tension, the back warp being held very tight, whilst the face warp is very lightly weighted. Many toilet cloths are arranged to have twice as many ends for the face as for the back. The ends for the face are drawn through the healds in what is known as "skip-shaft" order, viz.: 1, 3, 2, 4. The back ends being drawn through the mails of the jacquard harness, two ends for the face and one for the back are drawn through each dent, the back end being between the ends. When broad toilets or quilts are being woven, two jacquard machines are required, one for the centre of the cloth, the other for the sides. The harnesses are generally tied up to suit centred patterns, or those which come to a point. These jacquard machines are both raised at once by means of an eccentric cam, a treadle lever and draw rods at the side of the loom. The Patent Satin or Mitcheline cloth requires two 400's machines, Diggle's drop box motion operating two shuttle boxes at one end of the sley, and a continuous take-up motion. Two healds control the face ends, and two comber-boards are required to raise the harness threads. Healds

and comber-boards are operated by a side tappet. Each card represents four picks, the machines having the griffes raised two picks, and down two picks. Those two picks the griffes are down have the comber-boards raised, first one and then the other. During these two picks also the fine weft is picked, whilst the coarse weft is picked in the two picks in which the griffes are raised. The healds are operated two picks up and two picks down alternately, and are not both raised at once as in the case of ordinary toilets. The back warp in many cases has twice as many ends as the face warp, though sometimes back and face warps are equal.

KNITTING DEPARTMENT.

THE MANUFACTURE OF FASHIONED KNIT GOODS.

BY WILLIAM DAVIS, M. A.

PART FOUR.

Considerable attention has been given to the perfecting of the principle of fashioning on Cotton's patent frame and now the system has been rendered highly efficient and reliable. Its accuracy depends on the construction of the cams which operate the points, needles and sinkers during the fashioning course. Before the operation of transferring the loops is effected, the combined action of a number of different agencies is required and if one of those agencies is defective in its working, it is sufficient to cause the whole operation to miscarry.

The fashioning points which are arranged above the needles of the machine in a vertical direction are provided with grooves and the points are set in a bar which is of the same gauge or sett as the frame. The grooves underneath the fashioning points require to be such as will cover the beards of the needles and exert the necessary inward pressure on the beards in securing the loop. The whole operation of fashioning is shown diagramatically in the figures of Fig. *A*, numbered 1 to 6. The ordinary arrangement of sinker bar and discharging bits will be recognized, and the fashioning point *FP* above the needle, arranged to show its curved form. In diagram 1 the points are given in the position when the shafts are being changed from the knitting to the fashioning set of cams, the needle and sinker are in their normal position as well as the fashioning point. In diagram 2 the needle has gone somewhat to the right to allow of the downward movement of the fashioning point which in this sketch is seen closing over the beard or spring of the needle and pressing it into the needle groove. In diagram 3 is noted a still further movement of the needle to the right and a very decided descent, which descent has been shared by the fashioning point which still is in intimate contact with the needle. The result of those combined motions has been to remove the stitch from the needle to the fashioning point and the latter has received it well up on its stem or shank. In diagram 4 an upward movement of both needle and point is noticeable, the point having separated by a small space from the needle, bears the stitch near its end. In this diagram another important change has been made, namely the shogging or sidewise motion of the narrowing points prior to transferring the stitches to the neighboring needles. In diagram 4, therefore, the narrowing point is not above its original needle, but directly above the adjoining needle, and the sketch shows the fashioning point in the act of descending onto the neighboring needle and just dropping the loop onto the beard or spring. In diagram 5 a combined downward motion is noticeable and this is having the obvious effect of transferring the stitch onto the new needle, a result which is seen to be completed in diagram 6 where the point and the needle have risen together causing the stitch to be left on the needle stem.

At the completion of this move, the needle rises to its normal position and the fashioning point separates from it and assumes its customary place above the needles of the

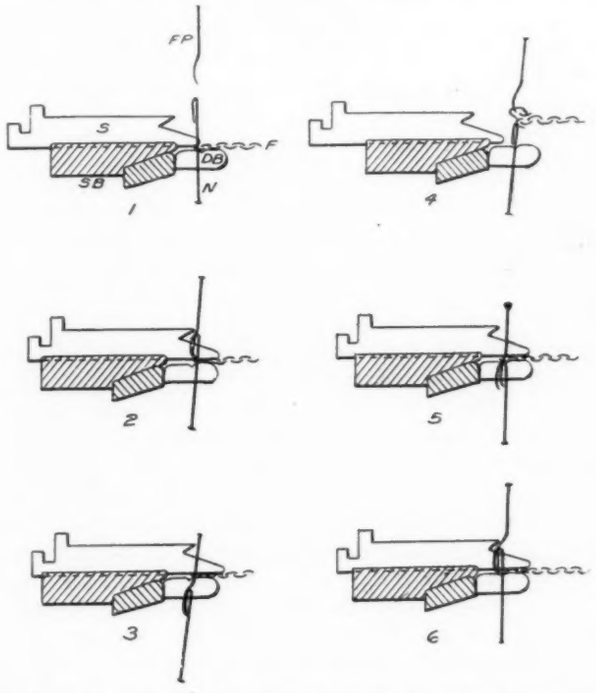


FIG. A. THE OPERATION OF FASHIONING SHOWN DIAGRAMATICALLY.

frame to await the next fashioning course. As the latter movement is being executed, the shaft shogs to the side again to change from the fashioning to the knitting set of cams.

The cams placed on the main shaft to effect the movements of the parts are shown in sketches *B*, *C*, *D* and *E*, and their form will be found to correspond to the movement of the various portions of the mechanism referred to. Cam *B* controls the movement of the needles through the agency of the needle bar during the fashioning course. Cam *C* is used for the needles to give them the out and in motion. Cam *D* serves the purpose of controlling the movement of the sinkers through the agency of the catch bar and gives the sinkers the out and in movement during fashioning. Cam *E* controls the up and down movement of the fashioning points.

The numbers round the circumference of the circles connected with the cams refer to the corresponding stages of the needle movement in the diagrams 1 to 6. Thus in the case of cam *B* the number 1 indicates the start as given in diagram 1. Between 1 and 2 is noticed a pronounced rise in the height of the cam which corresponds to a sinking of the needle and this descent is seen to be completed in the parts marked 1 and 2 where the cam reaches its extreme height. At the part marked 4 the cam becomes slightly lower in form which corresponds to the rise of the needle in diagram 4. In division 5 the cam reaches a still higher level, which corresponds to the extreme downward position of the needle in diagram 5. In division 6 the cam again approaches the normal which corresponds to the rising of the needle to its working position.

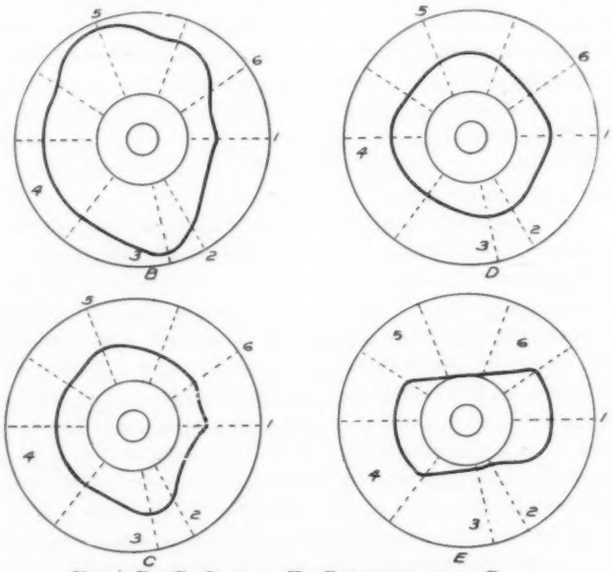
The other cams are less pronounced in form but an examination will show that their shape answers exactly to the movement which they are required to impart to the levers of the frame. The cam *E* is of particular interest as it controls the movement of the narrowing point. At the start it is high in form but in division 2 it becomes decidedly lower which causes the points to descend on the needle. In divisions 4 and 5 it becomes higher again which corresponds to the second descent of the points over the needles of the machine to transfer the loop, which from the lower height of the part is not so deep and the first dip is made to seize the loop.

THE SEAMLESS BOSOM ATTACHMENT.

One of the best sections of work done on the frame under consideration is the manufacture of ladies garments which are to fit the body in as exact a manner as possible. To enable this to be done, two pockets are placed in the bust of the garment and various ways have been devised to deal with this problem successfully. It may be done without fashioning at all, if the articles are made on the rib stitch machine when the natural elasticity and yield of the rib stitch is sufficient to give the extra accommodation at the bosom of the garment. The ribbed fabric may be said to have some corresponding disadvantages, chief amongst which is the tendency which it has of marking the skin with its own surface form which becomes uncomfortable, especially if the gauge of the fabric be not very fine. The difficulty with the fashioning referred to is that it does not take effect at the edge of the garment as in the case of the ordinary fashionings but has to be performed several inches from the side. The difficulty can be removed by making this part of the article in sections, three in the width and fashioning each section with side extensions, but the drawback to the method is that the portions have, subsequently, to be seamed together and as a thickening of the fabric is noticeable at this point, the joined edges coming right over the center, causes discomfort where it is least desirable. To overcome this difficulty an attachment has been added to the frame by virtue of which the sections of the pocket can be lifted from the needles in their entirety and fashioning take place several inches from the edges of the fabric with the added benefit that no after-seaming of the parts is necessary.

The nature of this problem is quite different to that presented in ordinary circumstances, when the fashionings can be accomplished by the usual side shapings. In this case they have to be effected some distance from the side and on the ordinary frame, the operation requires to be done by making the bosom portion in two sections, as illustrated in Fig. F. The total width of the fabric is shown by AB and the points at which the formation of bosom portions is necessary are given at C and D, where extra fabric has to be produced by increasing the number of stitches in action. The widening takes place from CD to the center points M and N where the fabric is worked plain and then a course of narrowing started which corresponds exactly to the widening.

If the manufacturer has his frames fitted only for the production of one class of fashioned goods such as half hose, then he will only have one set of points which will require him to make the bosom portions in three sections, AC, CD and DB. When the section AC is being made the left hand points only will be in work and widened as indicated for a certain distance and then narrowed back again. The part DB will be treated in a similar manner by the right hand points which will widen the section by moving to the left and returning again to the right in narrowing. To complete the bosom, the part CD is next taken up and both the right hand and left hand points brought into work



FIGS. B, C, D AND E, SHOWING THE CAMS.

to provide the extra fabric on each side as in 2. The extra material produced is afterwards seamed along the center line to form the pocket. As will be seen this involves a considerable loss of time, for it will take several times as long to make the fabric in the bosom portion of the garment as at any other part. If the manufacturer seldom requires to produce such articles, then he will be disposed to submit to the inconvenience and try to make up the extra expenditure by a corresponding increase in the price, but if he requires to produce fashioned goods in any quantity he will be well advised to have a second set of points attached which will reduce the labor by at least one-half.

The usual arrangement of fashioning points enable them to travel away from each other in widening and towards each other in narrowing, which is the position in the normal case. This is quite right when making the part CD but AC and DB cannot be made together on a frame fitted only with one set of points. This is achieved by introducing an extra set of points the same as the first and then the bosom can be made in two portions, the center portions as before described and the two side portions at the same

time as follows: For the part AC the left hand points of the second series set to widen and then narrow, and the right hand points of the normal set are arranged to have a similar motion. Thus in making the two parts together only the widening principle of the two sets of points is brought into play, for the first half of the bosom, and the narrowing principle for the second half. This operation may be more clearly followed by a study of Fig. F, diagrams 2 and 3. In diagram 2 the part CD is seen in work and the fashionings take place exactly as shown by the dotted line, the width being increased on either side until the middle is reached and for the parts M and N the width is stationary. The fabric is then narrowed back to the original dimensions by exactly the same speed of fashioning. In diagram 3 the part CD is pushed down on the needles out of work and the portions AC and DB are together brought into work. Both sets of points are placed for widening which proceeds along the dotted lines and narrowing is then began as before to complete the portion. The dotted sections of diagram 2 are next seamed to the corresponding portions of diagram 3 and a symmetrical pocket of the required shape is the result, which is shown complete in diagram 4. It will be recognized that the seam which runs through the

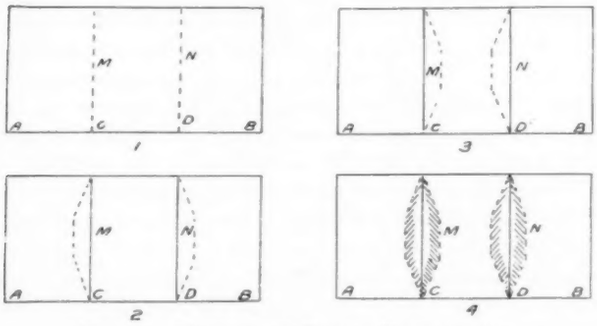


FIG. F. METHOD OF BOSOM FASHIONING.

center of the part is liable to become uncomfortable to the wearer because of the extra thickness required. To obviate this extra thickness a new method of fashioning has been devised which is entirely different to that just described and may be said to stand alone in its distinctiveness.

The new attachment is made for frames which are kept chiefly for this kind of garments and the attachment consists of a set of points on each side of the frame, so numerous that the fashioning is done by lifting sections AC and DB bodily off the needles and transferring the whole section either farther out or farther in. By this means the time occupied in the process is much reduced and the objectionable seam in the bosom part entirely obviated. The points are arranged the same gauge as the frame and occupy some eight inches of space on either side of the frame division. The points are worked by exactly the same mechanism as the ordinary fashioning tackle in widening and narrowing. The fashioning is further effected along two lines, four stitches from each other; at one time the fashioning occurs along the one line, at the next along the second line, and thus the open effect, which would in the ordinary course be the result of so frequent fashionings, is considerably reduced.

The chief advantage of this scheme of fashioning is that the extensions take place equally along the central lines M and N, for if the points were used in the ordinary way of work then the fashionings could only take place in one direction and the symmetry of the pocket would be destroyed. A reduced illustration of a pocket made on this principle is given in Fig. G, where the portions AB and CD correspond to similar parts of Fig. F. The four lines at C and D represent the four rows of stitches which in all seamless pockets run along the centre of the part from top to bottom. These stitches are perfect and the fashionings take place on either side of them in the manner indicated by the crosses where it will be noted that the widenings occur on either side of the lines on alternate courses and subsequently, when the plain part M and N has been passed, the narrowings are started on the same plan. The diagram is drawn about one quarter of the size which would be used in the case of a fabric of about 20 gauge. The exact scheme is as follows:

Left side of pocket—Widening: First dip widens one needle to left and then all the points move four needles to the left into position for the second line of fashioning. The machine now makes a second dip and widens one needle to the left, after which the points move to the right five needles into position for the next fashioning. This course is repeated in the case of 20 gauge, 20 times, when about 40 courses are worked plain for the centre parts M and N.

When the narrowing of the upper portions are started, the points work to the following scheme:

Left side of pocket—Narrowing: First dip narrow one needle to right, all points move five needles to the left to come into position for the fashioning on the second line. Second dip narrows to the right one needle and moves four needles to the right to recommence the process. The right

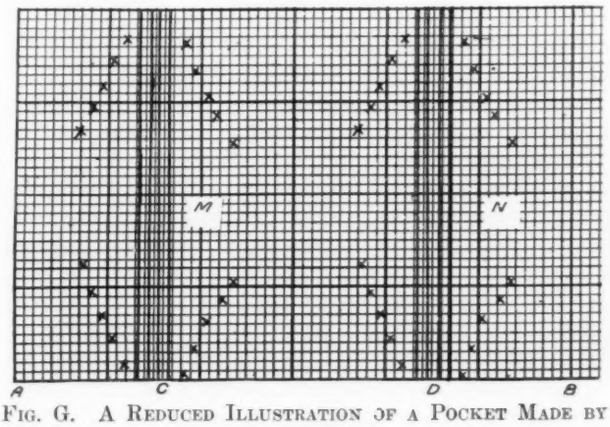


FIG. G. A REDUCED ILLUSTRATION OF A POCKET MADE BY THE PRINCIPAL DESCRIBED.

pocket is worked out on the same principles except that to widen, the points will move to the right and to narrow, they will move to the left.

For a fabric of this gauge, therefore, it will be seen that the bust will be complete in about 120 courses composed as follows: 40 courses fashioning for first part of the bust, 40 courses plain for the centre, and 40 courses for the upper part. The working out of the bust for articles of other gauges will be on the same principle. For a 16 gauge (16 times 2 needles on 3 inches) the fashionings would number 32 in the first part, the center portion would likely have 2 times 16 = 32 courses and the second part would have 32 fashionings on the two lines of fashioning.

The introduction of this attachment has given a great impetus to the development of the trade in ladies' union garments for underwear and more than that, one district can trace an important branch of its industry to the increased demands for those articles shaped as they are to the exact form of the body and conducing to a maximum of comfort.

Dyeing, Bleaching and Finishing.

REACTIONS IN COTTON BLEACHING.

BY J. C. HEBDEN.

Water, at ordinary temperatures, and even at temperatures corresponding to steam at 60 lbs. per square inch, has no action upon cotton providing air be excluded; air and steam, however, rapidly break down the fibre. In the absence of air, solutions of caustic lime or caustic soda containing as high as 10 to 20 grams per litre, are without action on the fibre, even at the highest temperatures employed in bleaching. In the presence of air, however, at relatively low temperatures, say, temperatures corresponding to steam at 10 lbs. per square inch, the cotton is rapidly disintegrated. Strong boiling solutions of caustic soda, say, 300 grams per litre, will dissolve cotton. In boiling, that there may be no possibility of attacking the fibre, the solution should not be more than 10 grams of caustic alkali per litre, and the kier should have sufficient volume above the cloth to exclude all air. All air entrained in the pieces when packed should be allowed to escape as the temperature is raised to the boiling point, and the boil continued for a sufficient time to ensure the escape of all the air. The circulation in all bleaching kiers is from the top downward. It is a question therefore whether, under these circumstances, all the air is ever removed from the ordinary kier.

The lime boil is not a real cleansing operation. The cloth is darker after being boiled than when in the gray. During the boiling the following reactions take place in the cloth: the starch is hydrolysed and removed; the saponifiable fats and waxes are changed to calcium salts and remain in the fibre; there is fixed on the fibre a percentage of calcium much greater than the equivalent of the fat and wax content of the cloth. In the souring subsequent to the boil, which is always necessary after the lime boil, the calcium salts are decomposed so that the soda boils may remove the fat and waxes. The amount of calcium fixed on the fibre varies from 2 per cent to 4 per cent, expressed as carbonate.

Scheurer, in his investigation of the saponification of the fats in cotton, found 2.88 per cent calcium carbonate after the cloth had been subjected to the lime boil, in addition to the calcium contained in the original fibre. Some observers claim the fixing of the calcium to represent a true mordanting. The author believes that cotton, if in the proper condition, may fix calcium to form a calcium cellulose similar to soda celulose. After bleaching, or some other treatments, it appears to lose this property of fixing calcium. The fact that cotton cloth which has been boiled and bleached does not produce as brilliant and clear a Tukey red as cloth which has been simply boiled and not bleached, may be explained by assuming that the fibre is not in the proper condition to fix calcium, and thus to ensure the formation of a full alizarine lake.

Scheurer, in the investigation above referred to, has shown that to saponify natural fats when boiling without pressure, the same time is required for both the caustic soda and resin boil and the lime boil; but that to saponify tallow twice as long a period is required for the lime boil as for the caustic soda and resin boil. When boiling under pressure, however, he found that the caustic soda and resin boil required twice as long a period as the lime boil to saponify both the natural fats and the tallow.

The fact that cotton goods can be scoured and the fatty matters removed in sufficient quantities for the production of a good bleach by either a single boil in caustic soda or resin soap or by a lime boil followed by a sour and another boil in soda ash lye, has turned the attention of bleachers toward the perfection of the caustic soda boil. The souring operation, which follows the lime boil, is thus eliminated, and the possibility of there being deposits of calcium salts left in the goods, on account of the imperfect souring and washing, is avoided. In the caustic soda boils, however, a good circulation of the lye must be maintained during the whole boiling operation.

In his experiment, Scheurer proved conclusively that the circulation of the liquor was absolutely necessary, and that without circulation indifferent results are obtained when using either caustic soda alone or in conjunction with resin or soaps. He also found that, in the case of the lime boil followed by the sour and a soda ash boil, circulation was not important.

Kiers with a positive mechanically-controlled circulation should always be used for caustic soda boils. Kiers of the ejector or injector circulating type are not to be recommended, because, in either case, the circulation is not positive. To insure a uniform action throughout the whole mass of cloth, it is the custom to boil and wash, and then repeat the boiling, so that the position of the goods is changed for the second boil. By this procedure the goods which are lying at the bottom of the kier in the first boil will lie at the top of the kier in the second boil. In this manner, a thorough penetration of the lye and uniform treatment are insured.

The saponification and removal of the fats and the destruction of the natural color, which is probably represented in the analysis by the nitrogen content, must precede the real bleaching process. If too small a percentage of the fats and color be removed or destroyed, whites which are not uniform or are not permanent result.

There is a rough test used by bleachers to determine the efficiency of the boiling process. This test consists in spotting a piece of dried goods, taken from the boiling or other process, with water, and noting the rapidity of the wetting out of the fabric. The test is best performed by cutting a piece about one inch square from the cloth, taking the precaution to have the edges cut clean and not ragged. If the edges are torn or ragged, the capillarity on the torn parts is not uniform with that of the cut edges, and the water will penetrate into the body of the fabric through the fibres longitudinally instead of transversely as when the edges are cut clean and smooth. By placing these pieces of cloth on the surface of water, it will be found that those pieces which have been thoroughly and fully boiled out sink instantly, but that those pieces which are not as well boiled out take a little longer time to sink, while pieces which have not been well boiled out float for a long time or do not sink at all.

Extracts from a paper read before the American Institute of Chemical Engineers.

The boiling operation is the critical part of the bleaching process, and in this operation the foundation is laid for the subsequent whitening operation by the action of the chlorine. Hence the dictum, "Goods well boiled are half bleached." The principal action of the caustic boil is on the protein bodies or nitrogen content. By the combined action of the steep and first caustic boil 91.5 per cent of the proteins are removed, and the second boil removes only 0.2 per cent more. While the boil is usually referred to as an operation for the saponification of the fats and waxes, it appears that the first function of the boil is to remove the proteins, which are almost twice as great in amount in the fibre as the fats and waxes, as shown by other extract. The second function of the boil is the removal of the fats and waxes by combined action of the steep and the first boil 20.4 per cent of these compounds are eliminated, and the second boil removes 43.6 per cent more. It is apparent, from a comparison of these figures with the percentage representing the elimination of the proteins, that the fats and waxes are less easily removed by caustic soda and that, after the removal of the proteins, more than twice as much of these bodies is removed in a single boil as was removed by two operations before the removal of the proteins. The fats and waxes of the cotton fibre must, therefore, contain a very large proportion of non-saponifiable matter.

The removal of 87.3 per cent of the constituents represented by the ash, and practically all of the constituents represented by the phosphoric acid, is to be noted as the result of the action of the steep and first boil, while the second boil removes 8.1 per cent more of the ash constituents.

Dr. Edward Schunk, F.R.S., in an address before the Manchester (England) Literary and Philosophical Society, showed, from an examination of the substances removed from cotton by boiling with alkali that the impurities in cotton consist of the following:—

1. Pectic acid, soluble in water, reddening litmus, and precipitated by metallic salts.

2. Nitrogenous colored bodies, soluble in alcohol.

3. Fatty acids, melting at 55.5 degrees C., apparently margaric acid or a mixture of stearic acid and palmitic acid.

4. A wax, resembling carnauba wax, soluble in alcohol and ether; insoluble in water and caustic soda.

5. Albuminoid bodies.

The presence of the wax, described by Dr. Schunk as insoluble in caustic soda, explains the low efficiency of the caustic boil as a method for removing the fats and waxes in bleaching.

After washing from the second caustic boil, the analyses show that 91.7 per cent of the proteins are eliminated; that 64 per cent of the fats and waxes, as shown by the ether extract, are removed; that 95.4 per cent of the constituents represented in the ash are no longer in the fibre; and that all of the compounds represented by the phosphoric acid are dissolved from the cotton.

After the washing from the boiling, the goods are treated with a solution of hypochlorite. This solution is the real bleaching agent. Bleaching powder, that is, hypochlorite of calcium, or lime chemic, as it is called, is generally used, but recently, owing to the introduction of liquid chlorine as a commercial product, hypochlorite of soda, or soda chemic, is coming to be recognized as a most convenient and reliable bleaching agent. Hypochlorite of magnesia has also been used industrially, but other hypochlorites, as for instance, zinc and alumina, have been tried only experimentally. Magnesium hypochlorite is a most excellent bleaching agent and shows no tendency to form chlorine substitution compounds; its action is purely oxidizing. Calcium hypochlorite has a strong tendency to form chlorine substitutions, particularly if the solution be acid. This tendency towards substitution, in addition to its oxidizing action, is one of the drawbacks in the use of lime chemic. Sodium hypochlorite is oxidizing in its action, and has but a slight tendency towards the formation of substitution products. It is a very active bleaching solution and stands about midway, in its properties, between magnesium hypochlorite and calcium hypochlorite.

Sodium hypochlorite forms no insoluble compound, while lime chemic always fixes a percentage of calcium in the fibre. Each molecule of hypochlorous acid, HOCl yields one atom of oxygen, which is the true bleaching agent. To treat the goods with the solution of hypochlorite, or chemic, they are saturated in a suitable machine, and piled in bins and allowed to lie for several hours, or they are floated in the hypochlorite solution for a sufficient period to produce the shade of white desired. The action of the chemic in the piling system is hastened by the carbonic acid gas in the air, while in the floating system the solution, on account of its volume, dissolves more completely and more thoroughly the colloidal substances from the fibre. The addition of weak acid, that is, acetic or formic acid, to the hypochlorite solution, to hasten the liberation of oxygen, is not to be recommended, because there is thus an increased tendency towards the formation of chlorine substitution products, particularly when lime chemic is used. The action thus becomes too rapid, no matter what kind of chemic may be used, and is not really under control.

The permanence of the protein residue in the cloth is emphasised by analyses after treatment with chemic. There is removed by the hypochlorite 0.5 per cent of the total proteins of the cotton, while there is eliminated 3.8 per cent of the total fats and waxes. By the combined action of the steep and the hypochlorite solution, 9.3 per cent of the fats and waxes are removed, while the first caustic boil removed 14.9 per cent. These figures seem to indicate that these compounds are removed by mechanical action fully as readily as by chemical treatment. The ash increases from the action of the chemic, due to the fixing of calcium by the cotton. Before we treat the cloth with acid to complete the bleaching, there have been removed 92.2 per cent of the proteins, 93 per cent of the constituents represented by the phosphoric acid, and 67.8 per cent of the fats and waxes as represented by the ether extract. The souring removes 0.5 per cent of the total proteins, 2.1 per cent of the total constituents represented by the ash, and 2 per cent of the total fats and waxes. So that the bleached cloth shows that of the total impurities, the following percentages have been eliminated:—

95.0 per cent constituents represented by the ash.

92.7 per cent of proteins.

69.6 per cent of fats and waxes as represented by the ether extract.

100.0 per cent of substances represented by phosphoric acid.

If we add to the percentage of the above impurities left in the cloth the percentage of the substances extracted by alcohol from the bleached cloth, we arrive at the conclusion that this piece of cloth contains 0.489 per cent of substances not cellulose. Before we accept this conclusion we must consider the fate of the carbohydrate content of the cloth. Starch would give the same percentage composition as cellulose, hence, we cannot expect to differentiate between cotton and starch in an ultimate analysis. We find, however, by qualitative tests, that starch is completely removed by diastase, or by the first caustic soda boil. The other carbohydrates, that is, the pectin bodies, are not idenified in the fibre by any known method. The fate of the pectin bodies, as well as the degree of hydration of the cotton in the various operations, seem to be indeterminable.

We gain hints of what might be taking place, however, from the carbon and hydrogen relations, but we are not justified in drawing any serious conclusions. We therefore draw this conclusion, that, since the starch disappears completely, and since it is acknowledged that the pectin substances are rendered soluble and dissolved by the methods used in bleaching, it is safe to assume that we have pure cellulose if the carbon and hydrogen numbers correspond to the theoretical, allowing for a reasonable error.

It is to be noted that some of the original protein constituents of the fibre are soluble in ether or alcohol, or both, as shown from the extracts from the grey goods and from the goods taken from the steep, and that the hydrolyzed proteins left in the fibre after the first caustic boil are completely removed by the ether and alcohol extraction. The phosphorus content does not appear to be wholly associated with the proteins. What the real composition of the ether and alcohol extract is, and what the relation of the phosphorus is to the protein, the fats and waxes, and to the inorganic constituents, is the subject of an investigation now in progress.

Througout the whole process of bleaching time is a very important element. On account of the colloidal nature of the fibre and of the impurities, it is necessary to allow the reactions to proceed slowly. For this reason bleaching cannot be hastened except with danger to the fabric. The old grass bleach, which required weeks or months as compared with our present bleaching method, requiring days, was a much more permanent and a much more beautiful bleach, because the impurities were removed slowly but completely. Therefore, it is to be recommended that all bleaching operations be conducted in solutions. The piling of goods, either saturated with chemic or saturated with acid, cannot be as efficient as allowing the goods to lie in solutions.

The six samples analyzed, when tested by the wetting out method described to determine the efficiency of the boil, and by the steaming method to determine the permanence of the bleached goods, give the following results:—

The grey goods and the sample taken from the steep did not sink in water, while all the other samples sank instantly. No difference in the time required for the pieces to reach the bottom of the beaker could be noted in the pieces taken from the second boil, the chemic or the sour. The piece, however, taken from the first boil required a perceptibly longer time to reach the bottom. No better illustration could be given of the failure of tests of this character to give positive knowledge. There is, in the sample taken from the first boil, 79.6 per cent of the total fats and waxes, and in the sample taken from the second boil 36 per cent, or a difference of 43.6 per cent; yet the wetting out tests show no corresponding difference.

But we must, however, note that the sample taken from the first boil showed that 91.7 per cent of the proteins are eliminated. We must also note that, after the removal of the proteins, more than twice as much of the fats and waxes are eliminated by one boil as are removed by the steep and the first boil. This raises the question, do the colloidal proteins serve as a more efficient waterproofing than the fats and waxes? When steamed, of the samples not bleached the sample from the grey and the sample from the steep showed the same yellowing, becoming decidedly browner. The samples from the first and second boil showed the same slight yellowing, and the samples from the chemic and the sour hardly changed in tone or shade.

From these results we must conclude that the proteins are the cause of the yellowing of the cloth in steaming, rather than the fats and waxes. Until we have positive proof that the amounts of the pectin substances present are the cause of yellowing in steaming, the above statement is a safe inference from the analytical result.

IN HONOR OF THE FOURTH.

The Katherine Hall Y. M. C. A. at the Ware Shoals Mfg. Co., Ware Shoals, S. C., prepared an interesting program for the 4th of July celebration. Because of the 4th coming on Sunday the exercises outlined took place on the 3rd. Folowing is the program:

8:30 A. M. Music at hall by Riegel concert band. Water sports on the pond. Music by Riegel concert band. Boat race. —Prize: $5.00 pair of shoes. Tub race—Prize: Merchandise to be selected, value $2.50. Swimming race—Prize: Merchandise to be selected, value $2.50. Moving pictures at hall from 9:00 to 11:20.

10:00 A. M. Field sports at base ball park. Music by Riegel concert band. (1) Wheelbarrow race—Prize: $1.00 cash. (2) Three-legged race—Prize: $2.00 cash. (3) Sack race—Prize: $1.00 cash. (4) Potato race for girls under 16—Prize: $3.00 pair of slippers. (5) Egg race for ladies—Prize: Selection at company store of article value, $2.00. (6) Hundred yard dash for men—Prize: $5.00 rocker chair. (7) Hundred yard dash for boys—Prize: $1.00 cash. (8) Climbing greased pole—Prize: Sack of money.

11:30 A. M. Invocation at barbecue ground by Rev. J. M. Dallas. Music by Riegel concert band. Opening remarks by Chairman D. L. Allen; speech by H. C. Tillman. Music. Speech by R. A. Cooper. Music. Speech by Hon. A. F. Lever.

12:30 P. M. Dinner at Barbecue grounds.

2:30 P. M. Music at ball park by Riegel concert band. Field sports (1) running broad jump for men—Prize, box of cigars. (2) Running broad jump for boys—Prize, $1.00 cash. (3) Running high jump for men—Prize, $1.00 cash. (4) Running high jump for boys—Prize, $1.00 cash. (5) Walking race for ladies—Prize, selection of article at company store, value $5.00. (6) Rooster race—Prize, $2.00 cash; second prize, $1.00 cash. (7) Penny race for boys

11 and under—Prize, $1.00 in pennies—scattered. (8) Tug of war between weave room and card room—Prize, box of cigars. (9) Battle royal (colored)—Prize, $3.00 cash for man staying in longest; $1.00 cash for man staying longest with him.

All cash prizes were donated by the people of Ware Shoals.

Moving pictures at hall from 3 P. M. to 10 P. M.

4:30 P. M.—Base ball game.

7:45 P. M.—Music at hall by Riegel concert band, followed by moving pictures.

A gold medal was awarded to the one securing the most points in the various events.

A four months' membership in the Y. M. C. A. was awarded each member of Ware Shoals team knocking home runs.

Practical Problems Discussed by Cotton's Readers

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all. Suitable letters are paid for in cash.

QUESTIONS ON BREAKING STRENGTH.

EDITOR COTTON:

In the April issue of COTTON someone asked the question "Why is there so much variation in the breaking strength of cotton yarn?" I think this question could be further enlarged to make it "Why is there so much variation in the strength of cotton yarn or cloth, in the gray, bleached, or mercerized?" This is a question which I believe should be fully agitated and I shall take great interest in reading replies from the various correspondents to this department. I would also like for someone to explain the relative comparison in the breaking strength of yarns in the skein and yarns in the cloth, the same numbers to be considered in each instance. K. C. (Ala.)

LONG CHAIN BEAMING.

EDITOR COTTON:

I wish some expert on long chain beaming would tell me some of the causes for excessive breaking of yarn at the beaming machines. What makes the threads stick and break at the saddle? What is the cause of loose threads in the chain? I will be glad to hear of anything that will improve the running of the beams. "X. X." (Mass.)

SCIENTIFIC MANAGEMENT.

EDITOR COTTON:

Relative to the criticism, or rather to the compliment, which was written by "Lanes" and which appeared in the June issue of COTTON would say, that he and I seem to agree on all points with but one exception, namely, that he does not think it quite the proper thing to have an overseer lose his wages when he is absent from the mill. If "Lanes" will re-read my article he will doubtless discover that I did not infer that an overseer should lose his wages when absent from the mill, but on the other hand believe as he does, that is, that if the man in charge, who necessarily is the man responsible, should be left in supreme charge and should be in a position to decide whether he can spare the time to leave the mill for any length of time.

I believe that the article written by "Lanes" to be a good one and would like to see more articles along this line appearing in COTTON. The question of scientific management has become a national question. While I have read considerable discussion for and against the application of so-called scientific management, I am in a position to know that the articles running in COTTON since January have been instructive and educational to the writer as well as others.

The criticism appearing in the June issue signed by "Student" afforded me much interest and I could not help but feel that there should be an answer forthcoming. "Student" says that he would like to know where an overseer's pay comes from when he is obliged to hunt about the city evenings in search of help and when he is obliged to work overtime for various reasons.

In answer to this, let me say that I consider the plant which compels or even allows its overseers to run about the city looking for help, very inefficient, and I am inclined to believe that a plant which will incapacitate itself in getting help this way will also entertain crude ideas of management. It is the duty of the Labor Department to supply help and it is not the duty of an overseer to run about the city nights looking for help. The overseer's duty is to see that the room is properly run. He should not be expected to hunt for his help; he should be expected to see that all work done under his jurisdiction is properly performed and at the lowest cost.

I am afraid that "Student" either works in a small plant or his experience has been very limited, otherwise he would not conceive the idea that plants run in an up-to-date manner ask their overseers to run about the city nights looking for help.

A. M. OLIVER.

SOME EFFICIENCY QUESTIONS.

EDITOR COTTON:

As a rule, what is said by men who have letters after their names is accepted as final. You seldom hear of a treasurer or agent seeking information from an overseer on the plant, or only in very rare cases, but instead they seek the advice of the efficiency engineer.

What is sadly needed in most every cotton mill is homogeneous service. If our best spinners, carders, and weavers were consulted before the mill was built, you would not find, as at the present time, ring frames and speeders in the same room, cards on the bottom floor, etc.

I do not claim to know it all, but I do claim to know where to get the best service from the equipment and it

is not always knowledge obtained from the efficiency engineer.

I recently had the pleasure of a long talk with an efficiency engineer. During the conversation he said, "Not long ago I hung up a mill on 42's yarn with a front roll speed of 134 revolutions per minute, the average length of the stock used was 1⅛ inches."

If this statement is true, then I know nothing of a cotton mill. Very few efficiency engineers have been overseers.

One concern employed the services of an efficiency engineer for trouble in the ring spinning and this expert found the trouble to be due to using the wrong saddle on the ring frame, that is, the lever on every roll was cut throughout the room. The room in question is now fully equipped with the proper levers, but the trouble still exists.

This letter is a sparker for the efficiency engineer.

What are the objections to having speeders in the ring frame room?

What effect does it have on the speeders?

Should it be called an evil? Wash. (Mass.)

FIGURING TWIST EFFECTS.

EDITOR COTTON:

I note an article in the March issue of COTTON from "H. E. W." (Maryland) commenting on my earlier letter. I am really glad to have this criticism. It lets a fellow know that someone is watching his efforts. However, if "H. E. W." will take the time to re-read my article and study the language used he will find that I did not give the examples as the proper way to figure a change, but used them as illustrations to show the difference between the theoretical and actual weight of the resulting yarn and that the difference is due to the contraction by twist. I still believe that the way I figured or illustrated the difference is clear and conclusive for the purpose used.

He says that my way is confusing and will bring about the necessity for a double calculating and double changing of the gears. I agree with him that if one tried to figure a change in this way it would be necessary to make two calculations and two changes. But for the purpose used I can't see where "H. E. W." or anyone else can object. If they have something better let us have it, as we all want the best, most accurate, and shortest method.

I must disagree with "H. E. W." in his presentation of a short method. There is entirely too much calculating to obtain the desired result and a man would have to be a pretty fair mathematician to handle his rule. A lot of overseers are just ordinary men and not instructors in mathematics. If I were making 30's yarn and decided to change to 16's I would figure in this way: 30's yarn has 6 per cent contraction by twist, what is the contraction for 16's? 16's yarn has 19 turns per inch. 19×6 per cent $= 114$. $114 \div 26.02$ (standard turn for 30's yarn) $= 4.38$ per cent of contraction for 16's yarn. Having ascertained the per cent of contraction for 16's yarn, the next in order would be to ascertain the H. R. 16.00's $\div$ 11.43 draft $= 1.40$ single roving, or 2.80 double roving. The draft constant is 320 and $320 \div 11.43 = 28.40$ or a 28 tooth gear. 28.40×4.38 (per cent of contraction) $= 1.24$, and 1.24 subtracted from $28.40 = 27.16$ or a 27 tooth draft gear.

I believe this to be as good rule as any and the shortest I have seen. If "H. E. W." or anyone else has anything better I want it, so ask them to come on and let us have it.

Student (Ala.)

PIECE WORK AND WAGES.

EDITOR COTTON:

In the June issue of COTTON I noticed an article entitled "Piece Rate System for Wages in Cotton Mills," which I found worth reading twice.

Efficiency engineers should not fail to read this article, for the ideas set forth are the root of efficiency. The author of the article has only one aim, and that is, to help the workers by giving them a chance to help themselves.

The hank board is an incentive to the worker. Every hand wants to head the hank board. The whole plan is in line with efficiency, because the tender of each machine will keep close watch of and care for all working parts so as to keep the machine in the best running order, as this helps in the effort to lead the hank board. There is no better system to obtain from any tender their knowledge of the machine or machines they have in charge. Many tenders know more about certain running defects and are in many instances silent, for they know and will tell you that they will be allowed so much, in other words, the majority of hands enjoy having their machine or machines stopped through some defect when paid by the day, but when paid by the hank, they will immediately hunt up the proper person to fix the machine, and at the same time give every assistance.

By having each operative know what every other operative is doing daily, acts as an urge that makes them unconsciously do more. Another advantage with this system is that no hand expects pay only for what was turned off by the clock, no matter if the hand has worked years without being absent. On the other hand, if operatives are absent for an hour or a day, and have worked steadily for years, if the hour or the day is deducted, they feel pretty sore about it. Wash. (Mass.)

ANOTHER ANSWER FOR OVERSEER.

EDITOR COTTON:

Replying to "Overseer, North Carolina," would say that too much humidity will cause the roving to lap around the rolls, when the ends break. Let him watch his room on a rainy day and see how many more roller laps he will find than on ordinary days. Hard twisted roving will also cause lapping on both leather and steel rolls. About dyed yarn, some dyestuffs have an affinity for moisture and will certainly cause laps. Fifty-five degrees of humidity is nearly enough in a spinning room running good stock.

Student. (R. I.)

A foreign trade bureau in New York City advises the commercial agent of the Bureau of Foreign and Domestic Commerce in that city that a firm of commission merchants in Cuba desires to represent American manufacturers of guaranteed hosiery, knitted underwear, and advertising novelties of all kinds. References are given. Refer to No. 17028.

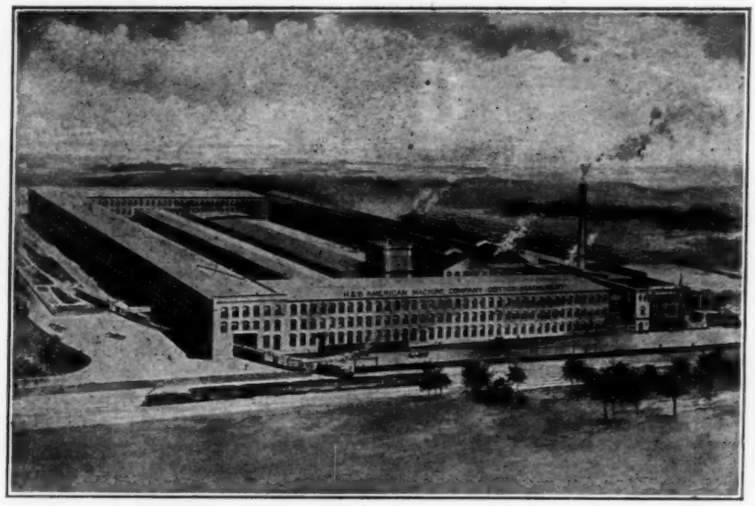
C. E. RILEY, Pres.
Boston Office
65 Franklin Street

Southern Offices
814-815 Empire Bldg.,
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

Notes About Men You Know.

J. I. McGREGAR, Forest City, N. C., has accepted a position as Superintendent for the Lowe Mfg. Co., at Huntsville, Ala.

JAMES MUNN, Superintendent and Buyer at the Lowe Manufacturing Co., Huntsville, Ala., has resigned from this position.

T. B. SPENCER has been transferred from superintendent of the Wylie Mills, Chester, S. C., to a position in the head office of the Parker Cotton Mills, at Greenville, S. C.

B. A. WRIGHT has been elected president of the Pepperton Cotton Mills, Jackson, Ga., replacing J. B. Watkins, resigned.

E. E. BOWEN has been promoted from overseer of weaving at the Victor Mills, Greer, S. C., to superintendent of the Apalache Mills, Arlington, S. C.

THOMAS HUNTER has assumed his duties as superintendent of the Anchor Webbing Co., Woodsocket, R. I., having been engaged to take this office to relieve H. M. Fillebrown, who has been doing the work of treasurer and superintendent for the past year.

CHAS. T. WOLFE is now acting as superintendent as well as president of the Puritan Cordage Mills, Louisville, Ky.

T. J. McNEELY has accepted a position in Guthrie, Okla. He will take charge of the Pioneer Mills as superintendent.

PETER DOCKRAY, the well known and popular superintendent of the Lawton Spinning Co., Woonstocket, R. I., is confined to his residence by illness.

STERLING GRADON, superintendent of the Atherton Mills, Charlotte, N. C., was recently also elected president of that mill.

J. G. PLATT, of Augusta, Ga., has accepted the position of superintendent of the French Broad Mfg. Co., Asheville, N. C.

PAUL A. READ, connected with the Barnaby Manufacturing Co., Fall River, Mass., for many years, has been engaged as superintendent of the Seaconnet Mills to succeed Thomas E. Heatley, who resigned to accept a position with the Maverick Mills, East Boston.

JOHN T. KERSEY has resigned as superintendent of the Marble City Cotton Mills, Sylacauga, Ala.

W. H. BOYNTON has accepted the position of treasurer of the Highland City Mills, Talladega, Ala.

HERBERT L. MOORMAN, president of the Lynchburg (Va.) Cotton Mills, has been granted a leave of absence by the directors of the mill and will take an extended rest.

E. W. SWIFT has been re-elected president of the Swift Spinning Mills, Columbus, Ga.

W. L. DUMAS has been promoted from secretary and treasurer to president of the Highland City Mills, Talladega, Ala.

T. F. DOOLEY has accepted the position of superintendent of the Richmond Hosiery Mills, Rossville, Ga.

W. D. McCOMBS, of Spartanburg, S. C., has accepted the position of superintendent of the Athens (Ga.) Mfg. Co.

$5.00 Imported High Speed Indicator Outfit in Case

FREE To You for a few Minutes of your time.

Our Service Department desires the opinions of active mill men on the quality of the work shown in the advertising pages of this issue of COTTON.

We are, therefore, going to give this indicator for the best letter by a mill executive who gives the clearest and most definite reasons why, and in what manner, any certain advertisement is, in his opinion, the best.

Contestants must be mill executives, from overseers to presidents, connected with spinning, weaving, knitting, or finishing plants. The letter must be accompanied by the name, address and official position of the writer in order to be eligible.

The judges will be the Editor of COTTON and the Manager of the Service Department, whose decision will be final.

Address Contest Department of COTTON, Atlanta, Georgia.

R. L. GADDEY has accepted the position of superintendent of the Huss Mfg. Co., Bessemer City, N. C.

FRANK W. GURRY, general manager of the Postex Mills, of Post City, Tex., who has been North for some time on a business trip, attended the recent Southern New England Textile Dinner at the Pomham Club, shaking hands with his many friends. Mr. Gurry is a Providence boy. He was also present at the Asheville convention of the Southern Textile Association.

WALTER S. MITCHELL, agent of the Chicopee Manufacturing Co., Chicopee, Mass., has resigned his position. He had been associated with the Chicopee Co. for over a year, going there from Biddeford, Me., to replace Thomas Perkins, who was superintendent and agent up to that time. Isaac T. Prosser, of the Harmony Mills, Cohoes, N. Y., will act as agent in the future.

W. A. SMITH has accepted the position of superintendent of the Southern Mills Corp., Oxford, Ala.

J. F. MILLER, who has been superintendent for the past five years of the Silver Lake Co. of Newtonville, Mass., has resigned his position. Previous to coming to the Silver Lake Co., Mr. Miller was with the Danielson Cotton Co., as superintendent for some little time and then went to the Merchants Mill of Fall River as overseer of carding, from which position he resigned to go to the Silver Lake Co.

F. H. BROMLEY has accepted the position of superintendent of the Maysville Cotton Mill, Maysville, Ky.

EDWARD H. RATHBURN has taken a house at Seakonnet Point for the Summer. Mr. Rathburn is president of the Rathburn Knitting Co., Woonsocket, R. I.

C. W. TAYLOR is now president of the Valley Creek Mills, Selma, Ala.

MILTON SAYLOR has accepted the position of secretary and treasurer of the Valley Creek Mills, Selma, Ala.

WILLIAM MYER, who has been superintendent at the cotton mill of the Warren Manufacturing Company, Warren, R. I., for many years, has terminated his services with the company. His successor is Charles Thomas.

ROBT. COLEMAN has accepted the position of manager and superintendent of the Valley Creek Cotton Mills, Selma, Ala.

WILLIAM HALLIWELL, agent of the Lawton Spinning Co., Woonsocket, R. I., has purchased an 8-cylinder Cadillac automobile.

J. F. BROOM has resigned as overseer of spinning at the Locke Mills, Concord, N. C., to accept a similar position at the Riverside Mills, Danville, Va.

JOHN H. STEVENS has resigned as overseer of carding at the Richmond Hosiery Mills, Rossville, Ga., to become superintendent of the Aseptic Cotton Products Co., Chattanooga, Tenn.

G. B. COLLINS has resigned as night overseer of spinning at the Prendergast (Tenn.) Cotton Mills, to become second hand in spinning at the Louisville (Ky.) Mills.

ROBERT HEALEY has been promoted from second hand of spinning at the Greylock Mill to overseer of mule spinning at North Pownal, Vermont.

I. W. WHITE has resigned his position at the Brookside Mills, Knoxville, Tenn., to become overseer of weaving at the No. 1 mill of the Merrimack Mfg. Co., Huntsville, Ala.

A. A. SHORT, of Albermarle, N. C., has accepted the position of overseer of spinning at the Cowpens (S. C.) Mfg. Co.

T. J. DIGBY, JR., has resigned as second hand in weaving at the Oakland Mills, Newberry, S. C., to become overseer of weaving at the Social Circle (Ga.) Cotton Mills.

Photo by A. H. Schaefer, Buffalo, N. Y

Technical High School, Buffalo, N. Y.
Architect: Martin C. Miller, Buffalo, N. Y.
General Contractors: Mosier & Summers, Buffalo, N. Y.
Roofers: Kelker Blower Co., Buffalo, N. Y.

On a modern building—

Here is the handsome, new High School at Buffalo, New York—a fine example of first-class modern construction throughout.

It is covered with a Barrett Specification Roof.

Now that the roof is completed it will not be necesary for the authorities to give any further thought to it for twenty years or more. It will require no painting, no repairs, no maintenance cost of any kind.

These roofs take the base rate of insurance and are approved by the Underwriters' Laboratories.

It is a bit unusual, perhaps, to find that the cheapest permanent roof to build is also the *best* roof—yet that is the case with Barrett Specification Roofs. Their low cost and long life account for their high standing and popularity with first-class architects, engineers and roofers.

To be sure of getting a Barrett Specification roof on your building, send to our nearest office for a copy of The Barrett Specification with diagrams and *incorporate same in your building plans.*

We should like to send every architect, engineer and building owner a copy of the Underwriters' Laboratories report on Barrett Specification Roofs. Address our nearest office.

Hydronon

The Damp-proofing Paint

Construction expenses can be reduced by applying plaster directly on the brick or concrete without air space or lath construction. The use of Hydronon makes this practicable. This paint applied to the interior surface of the wall, seals it tight and furnishes a safe and dry base for plaster. Booklet free on request.

Tar-Rok (Tar Concrete) Sub-Floors

The most suitable surface on which to bed plank where a wooden lower floor is desired in factories, storehouses, etc., providing a maximum of strength, rigidity and fire protection at a minimum cost. The planking is laid on the tar concrete while the latter is still soft, giving perfect solidity and making vibration impossible. The tar excludes dampness, provides a warm floor and protects the plank from decay. Booklet on request.

Special Note We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding. If an abbreviated form is desired, however, the following is suggested. ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15, 1911, using the materials specified and subject to the inspection requirement.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle
THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg Vancouver
St. John, N. B. Halifax, N. S. Sydney, N.S.

TRADE B MARK

JOHN DAWBER, for more than 20 years the master mechanic at the Greenville plant of the United States Finishing Co., has tendered his resignation to Manager John F. Rogers, effective July 1, and will retire from active work.

JOHN W. MCKINLEY, draughtsman at the Greenville, Conn., plant of the United States Finishing Co., for some years past, will succeed John Dawber as master mechanic.

C. G. EVANS, of the Poe Mills, Greenville, S. C., has invented and applied for a patent on an attachment for a loom.

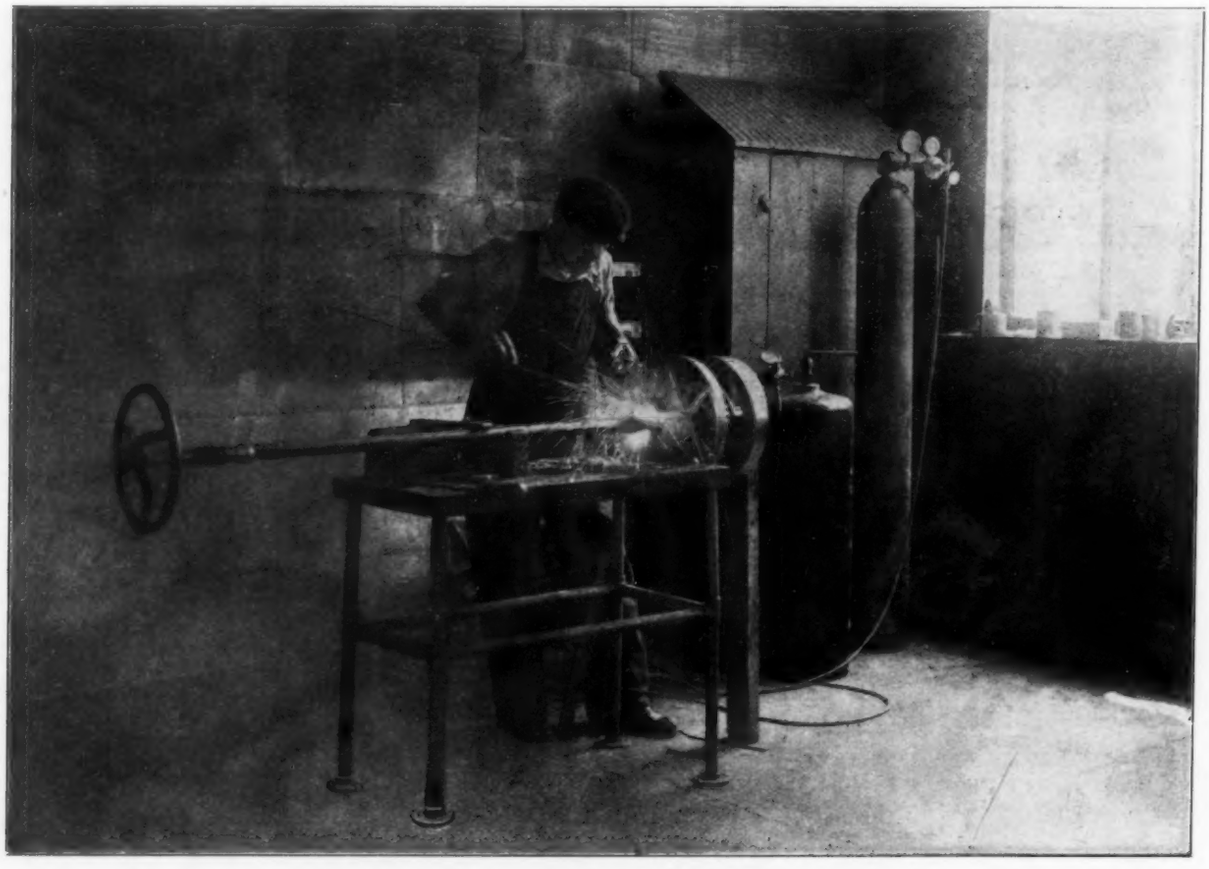
G. S. WATKINS, of Caroleen N. C., has accepted the position of overseer of spooling and warping at the Clinchfield Mill, Marion, N. C.

I. P. CHAPPELL is now superintendent of the yarn department of the Russell Mfg. Co., Alexander City, Ala.

New Machinery and Trade Notes.

A Repair Shop Process.

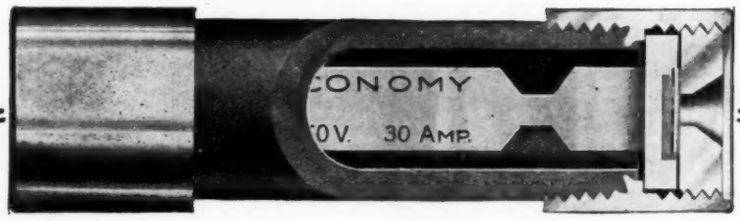
One of the very necessary adjuncts to a well regulated cotton mill is a thoroughly equipped repair shop. The need of making emergency repairs on the premises and doing this in a thorough manner and in as short a space of time as possible, often saves the mill a great deal of machinery stoppage, therefore, money.



WELDING A BROKEN SHAFT.

In visiting among the mills and talking with the executives, there is one feature of the repair man's kit that has quite recently began to attract attention among cotton manufacturers and which always receives the unqualified approbation of its owner. This is the apparatus for the oxyacetylene welding process.

A secretary of one mill, in taking the writer through the plant, led the way to some repaired work of this character and spoke in glowing terms of the value of such a machine in cotton mill repair work. The superintendent of another plant stated that he had saved more than the price of the entire equipment in the first month's work accomplished with it. He explained, in this connection, that the amount of repair work per month would not reach the amount indicated, but that during the first month in which they had the equipment, enough broken parts were rescued from the scrap pile and repaired to more than pay for the original cost of the entire outfit. Another superintendent said that his equipment saved him hundreds of dollars annually. He formerly used a method of brazing in repairing breaks in cast iron work, but it was not in any way satisfactory as compared with the work done by the oxyacetylene process. Still another superintendent said that since the introduction of this machine into his repair shop it had become an absolute necessity and he did not see how he could get along without it.



"The fuses that save 80% per year" are the logical fuses for you to use—

ECONOMY renewable cartridge FUSES

are giving positive electrical protection and cutting fuse maintenance 80% in great industrial plants, central stations, mines, department stores, steam and electric roads, etc.

ECONOMY renewable cartridge FUSES are the only renewable fuses uniformly rated—the Economy design is the only design so far produced that provides the desired electrical characteristics. All capacities of renewal elements are readily available, making large fuse stocks unnecessary. ECONOMY renewable cartridge FUSES never vent fire nor hold a sustained arc—they are absolutely safe. Now available in knife blade and ferrule types.

Special Announcement

Two renewal elements are now furnished (without charge) with each Economy fuse. Now you figure what fuse is the cheapest, not only to buy, but also to maintain.

Bulletin No. 7 and Samples on Request. Write now

Economy Fuse & Mfg. Company, Kinzie & Orleans Street, **Chicago, Ill.**

Good Weavers Favor Loom Production

Shambow Shuttles Are Good Weavers.

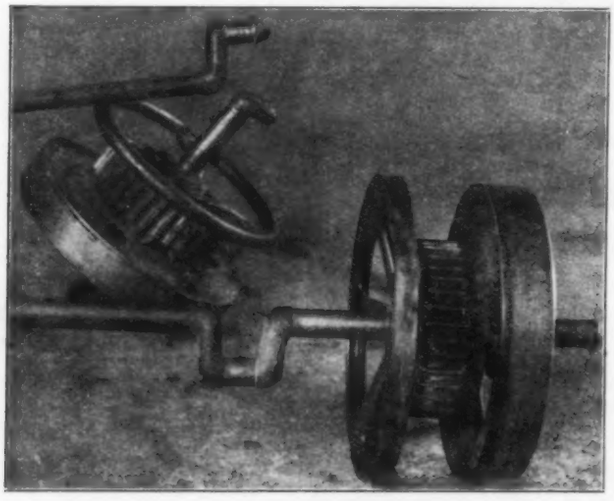
To Weave Better Cloth and More of it Per Loom, and at less Cost For Supplies, get in touch with

Shambow Shuttle Company

Designers of efficiency shuttles

Woonsocket R.I.

The uses for an equipment of this character in the mill repair shop are many and instances have been cited to the writer where the equipment is being used to weld cast iron, brass, copper and aluminum. The accompanying photographs show a corner in a southern mill repair shop devoted to this welding process, with the operator in the act



A BROKEN PART AND ONE REPAIRED.

of repairing a broken part. The other photograph was taken in the same shop and shows one of these repair jobs completed and another awaiting the repair man's attention. These photographs illustrate only one of the many items of emergency repair to which an apparatus of this character is adapted.

The Home Electrical

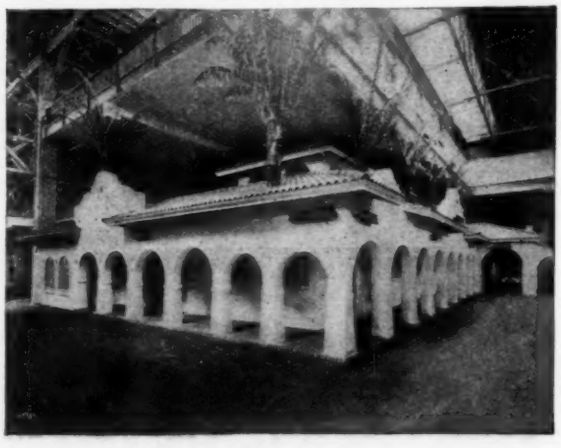
A novel exhibit at the Panama-Pacific Exposition, is the "Home Electrical" in the Palace of Manufactures. This is a full-sized model home in which electricity is made to perform the domestic tasks and labors. Electricity cooks, washes, launders, sweeps, dusts and fulfills countless other household duties; and it also heats, lights and cools the house.

This is but one of the exhibits of the GENERAL ELECTRIC COMPANY. It is co-operative to the extent that it comprises a very comprehensive display of devices operated by this company's motors, many of the devices themselves being the products of other manufacturers, several of whom have no other representation at the exposition. The home is in no sense an exhibition to demonstrate the radical things that may be done with electricity in a house. It is in every way a practical modern home, and every one of the electrical devices shown is entirely suitable for the average family. The exhibit is completely operative and is intended to be broadly educational.

The building is of simple, Spanish-California bungalow design and moderate cost. The exterior is of gray stucco, the roof, red tile and a columned portico extends along two sides. The interior consists of a large living room, dining room with breakfast alcove, bedroom, nursery, sewing room, bath, kitchen, refrigerator room and laundry. There are also an electric garage, a workshop and a small creamery. The home is completely furnished and attractively decorated, all in good taste, ready for occupancy.

The veranda is illuminated with Mazda lamps in suitable fixtures; the house number is an electric transparency, and electric bells operated by transformers announce your presence at any door. The living room is lighted with Mazda lamps placed in semi-indirect fixtures, the light being diffused and distributed by reflection from tinted walls and ceilings. An electric "fireplace" of the luminous radiator type furnishes both warmth and pleasing light The electric piano player will entertain visitors either with classical or popular selections.

Adjoining the living room is the dining room. This is lighted by Mazda lamps in fixtures that provide direct illumination through tinted shades. It is heated by electricity and the air is kept constantly refreshed by a small electric fan. Here are electric heating devices for the preparation of lunches and light refreshments; a radiant toaster, an electric coffee pot, a tea samovar, a disc stove for general cooking, a uni-set, a chafing dish for preparing hot soups or deserts and an electric grill for broiling, toasting, preparing eggs, etc. If desired, a very substantial meal can be cooked on the dining-room table. Another electrical feature is the warming closet at the entrance to the butler's pantry. To the right of the dining room is the breakfast alcove, very cosily arranged and also equipped

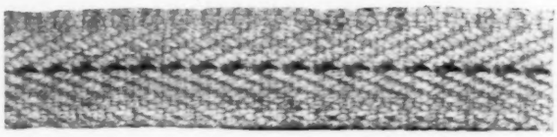


"HOME ELECTRICAL" OF THE GENERAL ELECTRIC COMPANY EXHIBIT AT THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

for "table-cooking." It looks out upon a vine-covered patio with ferns and flowers and a tiny spring.

Between the dining room and the kitchen is the butler's pantry. In it is installed a combination butler's sink and dish-washer for cleaning the light and valued wares. On a shelf there is a disc stove for making dressings and sauces, and a small electrically driven buffer for polishing nickel and silver pieces. On the wall is the annunciator of the door bell system.

In the kitchen, the workshop of every home, an electric range, equipped with hot plates, broiler and ovens, is ready to cook the largest family dinner. A constant supply of hot water is obtained from an electric water heater attached to the usual kitchen water tank. A household ozonator and exhaust fan combine to remove unpleasant odors. Should the day be chilly, a portable air heater can be put into service. A new device, which does away with dirty and impure ice, is the electrically lighted and cooled refrigerator, where small cubes of ice also may be obtained. There is an electrically driven ice cream freezer, and a connection



American Textile Banding Co.

(Incorporated)

Third and Moore Streets

PHILADELPHIA, PA.

Manufacturers of SPINDLE TAPES and BANDS

MR. MANAGER:—

You are interested in some, at least, of the following items, and we are interested in you having them in the best shape at the proper time:

1—Seed and Meal Tags.
2—Warehouse Receipts, printed or lithographed.
3—Warehouse Tags.
4—Gin Tickets.
5—Tag Hooks and Wires.
6—Cotton Talley Books.
7—Cotton Books, for Bought and Sold Cotton.
8—"Montague" Addressing Machines for Shipping Tags, etc.

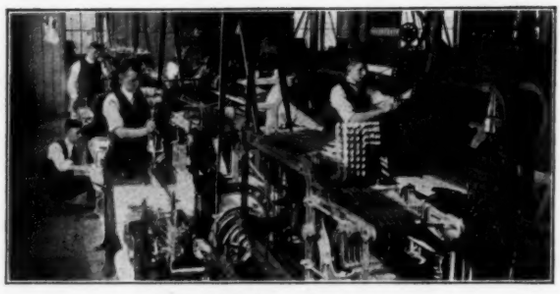
What are your requirements for the coming season? Let us serve you. Write us now!

ROBERTS & SON

The Printers and Stationers, Birmingham, Ala.

TEXTILE ENGINEERING

GEORGIA SCHOOL OF TECHNOLOGY



Practical Work in Weaving.

THE SOUTH leads the world in cotton growing and will soon lead in cotton manufacturing. To hasten this result more southern men must be trained for leadership in the textile industry.

The Textile Department of the Georgia School of Technology has an equipment which for variety and completeness is unsurpassed. Every process from the raw cotton to the finished fabric is thoroughly taught.

Two courses are offered: A four-year course leading to the degree of B. S. in T. E.; and a two-year course leading to a certificate in T. E.

Courses are offered also in ELECTRICAL, CIVIL, MECHANICAL, AND CHEMICAL ENGINEERING, CHEMISTRY, ARCHITECTURE, AND COMMERCE.

For catalog or further information, address K. G. Matheson, Pres., Atlanta, Ga.

You Will Be Delighted With

Howe Mill Crayons

Try Them and See

Howe Mill & Crayon Co.,

LOWELL, MASS.

Free Samples on Request

CHINA CLAYS AND TALCS

Adapted for

Loading and Finishing

DUNN & KRUSE

MAIN OFFICE, 180 SOUTH ST., NEW YORK

The Walsh & Weidner Boiler Company

CHATTANOOGA, - - TENNESSEE

Horizontal Return Tubulars
Heine Type Water Tube
With or Without
STEEL CASINGS
Towers and Tanks, and all Types of Special Plate and Structural Work

Diamond FIBRE

ROVING CANS
MILL BASKETS
BARRELS BOXES

Will neither dent nor break when subjected to hard usage. Stronger than wood, lighter than steel.

Write for Bulletin 12.

DIAMOND STATE FIBRE CO.

Bridgeport, Pa. Elsmere, Del.

Branches in Principal Cities.

with the inner-house phone for saving steps is the final kitchen convenience.

The bedroom contains many electrical conveniences and articles for the toilet, including an electric massage vibrator, curling iron, hair dryer and boudoir lamps. There is an electric heating pad and a small electric water heater in case of sickness. The bedroom is heated by electricity in chilly weather and cooled with an electric fan when the nights are too warm. There is a connection for the vacuum

BREAKFAST NOOK IN THE "HOME ELECTRICAL."

cleaner. Most interesting of all the electrical appliances in the bedroom is the burglar switch, which, when needed, lights every lamp in the house.

Near the bedroom is the nursery with its electric toys and an electric device at the window to keep the room supplied with fresh air without dangerous drafts. The nursery is heated by electricity and there is an electric nursery outfit for preparing medicine, food, etc., in case of sickness. An electric heating pad is also provided to warm up cold hands and toes.

The bathroom is finished in white tile and porcelain. Here are such electrical conveniences as a hot water cup for shaving, a glowing electric radiator, an electric vibra-

KITCHEN IN THE "HOME ELECTRICAL."

tor and a hair dryer. An exhaust fan and an electric ozonator maintain a wholesome atmosphere. The hot water for the bathroom is drawn as usual from the tank in the kitchen.

The sewing room is replete with electric appliances for sewing, mending and dressmaking. The sewing machine is operated by an electric motor controlled by the foot treadle A three- and a six-pound electric iron are located on a convenient board, and a small portable vacuum cleaner is used to pick up threads and scraps of cloth

The home is equipped with a complete electrical laundry.

Provision has been made, in the shed, for constant water pressure all over the house when the water supply is a well or spring. Here is installed an automatic air-pressure system. The pump is driven by a small electric motor, controlled by a pressure switch.

Nearly every home has a workshop where the-man-of-the-house builds and repairs, especially in country places. The shop is equipped with a workbench, bench-type drill press, clipping hammer, electric riveter and grindstone. Then there is a buffing outfit, saw table, bench type lathe and metal melting pot, all electrically operated. Handy little electric soldering irons and an electric glue-pot aid in repairing leaky utensils or broken woodwork. An air heater provides comfort.

The "Home Electrical" demonstrates the extent to which electricity is readily adaptable for all kinds of domestic service where light, heat and power are required. These electrical devices are simple to use and comparatively moderate in cost.

THE S. K. F. BALL BEARING COMPANY have been obliged to greatly increase their office space in the Hudson Terminal Building. Within the last four months, they have about doubled their offices so that they now occupy a full wing on the 6th floor of the Hudson Terminal Bldg., 50 Church St., New York.

This company is the only ball bearing company importing bearings from Europe that has not been interferred with by the war. Sweden, being a neutral country, is enabled to send large and regular shipments via Norway and Denmark without entering the war zone. These Swedish imported ball bearings are now very much in demand on account of the high grade of the material and superiority of workmanship. The bearings are made in Gothenburg in a model factory employing 3,000 hands, engaged exclusively in the manufacture of S. K. F. ball bearings.

Arabol Gum G, one of the staples of THE ARABOL MFG. Co., 100 William St., New York, when used in its pure state, gives excellent results in light or heavy sizing of cotton warps and is especially recommended for use in export goods, such as China shirtings, drills, denims, coarse or medium goods, etc. Mixed with starch, it gives volume and adhesive power, adding at the same time, elasticity and tensile strength.

K. E. Kersten has been appointed branch manager of the BOSTON BELTING CO., 172 West Randolph St., Chicago. A large and varied assortment of their well known brands of high grade belting, hose and packing is constantly carried in Chicago to facilitate the prompt shipment of staple goods. Careful, competent and courteous attention is given to all inquiries.

FRED S. HINDS, Mill Architect and Engineer, has removed from 19 Milk St. to 1119 Oliver Building, 141 Milk St., Boston. Fifteen years ago Mr. Hinds opened his first office in the Essex Building near South Station. He had just resigned his position with the late Stephen Greene, sole partner at the time of Lockwood, Greene & Co., Mill Engineers, after a service of 18 years.

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Established 1898

Makers of tape for all kinds of tape drives and all makes of machinery. Makers of listings, leaders and all kinds of mill tapes

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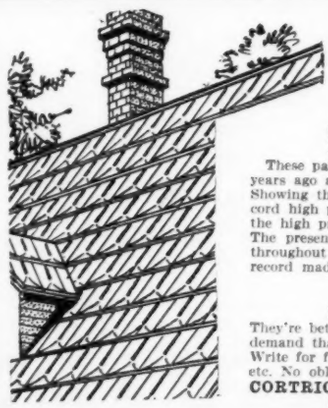

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Painted (Red or Green)
METAL SHINGLES

These painted metal shingle roofs put on 28 years ago are as good as new today; Showing that there is no need to pay the record high price for galvanized shingles due to the high price of spelter.

The present great demand for metal shingles throughout the country was created by this record made by

CORTRIGHT
Painted
METAL SHINGLES

They're better than ever today, and in greater demand than ever.

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CORTRIGHT METAL ROOFING CO.
Philadelphia and Chicago.

JOHN D. LEWIS

Manufacturer of

Logwood Extracts & Hematine

Providence, R. I.

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which **add at least 50% to its value to YOU.**

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVINGS WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write me.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."

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WEST POINT, GEORGIA

AN ideal location for manufacturing industries, having access to three railroads. Cheap power, plenty of labor, and healthy climate.

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THE MINERAL SOAP

THE DETERGENT WITHOUT AN EQUAL

Washes thoroughly and quickly—rinses freely. Brightens and sets colors.

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THE ELECTRIC SMELTING & ALUMINUM CO.

Lockport, New York

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Prompt attention to inquiries.

ACME PRINT COMPANY
320 No. Ninth St. Reading, Pa.

KNITTING MILL NEWS

Notices of mill projects, additions or improvements are solicited for this department. Other notices pertaining particularly to the Southeastern section will be found in the Southern Mill Situation review.

INDIANA.

MISHAWAKA.—H. G. Christman & Co., South Bend, Ind., have been awarded a contract for the erection of the large addition to the plant of the Mishawka Woolen Manufacturing Company, woolen footwear, lumbermen's socks, etc. The improvements planned will necessitate an estimated total investment of $500,000. Approximate dimensions of proposed building are 100 x 235 feet for four stories, and 100 x 165 feet for two stories, with basement. At the north end of this building will be erected a three-story 85 x 65-foot ell. The buildings will be of concrete and steel construction, and will be fireproof throughout. After this construction has been completed a large six-story office building will be erected. Albert Kahn, Detroit, Mich., is the architect.

NEW JERSEY.

BELVIDERE.—A quantity of new machinery is being installed in the plant of John E. Allen, misses' and ladies' ribbed hose, to take care of increased business received.

PERTH AMBOY.—The Board or Trade, it is understood, is to finance the erection of a building for the Nelson & Lansberg Company, muslin underwear manufacturers at Perth Amboy, for which contract has been let. Building will be 66 x 90 feet, two stories, of brick construction, giving an approximate floor space of 12,000 square feet. Jensen & Brooks are the architects.

NEW YORK.

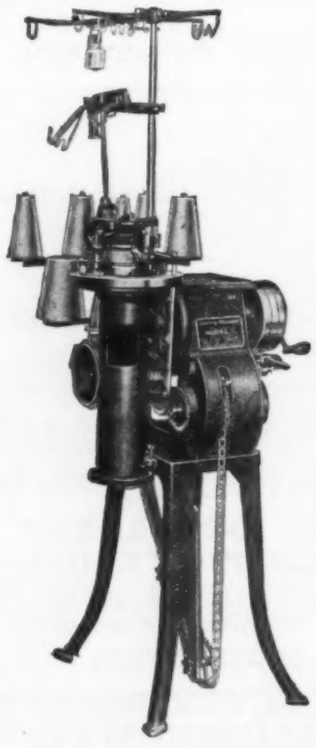
CUBA.—The hosiery mill to be established here is to be in operation at an early date under the name of the Cuba Knitting Mills. Capital is being furnished by Henry C. Martin, president of the First National Bank.

NEW YORK.—The Oak Knitting Co., which operates mills in Syracuse and Arcade, N. Y., and Ypsilanti, Mich., manufacturing men's, women's and children's ribbed underwear, has opened an office at 366 Broadway where the product will be sold direct.

PENNSYLVANIA.

PHILADELPHIA.—An additional story will be built on the present Philadelphia plant of H. A. Romberger Knitting Co., Frankford avenue and Orleans street. The plant is now one story and basement, so the additional story will add materially to its quarters. The addition will be of brick, 40 x 100. There are at present about 125 machines in operation at this plant, and 30 additional machines are on order, which will mean an increase in the production of at least 25 per cent.

PHILADELPHIA.—Harry C. Aberle has been elected to succeed Henry Brown as manager of the Brown-Alberle Co., manufacturer of hosiery at Palethorp and Huntington streets, Philadelphia. Henry Brown, who was also treasurer of the firm, has disposed of his stock in this company and severed all connection with it. He is not yet prepared to make an announcement as to his plans. For the present no treasurer has been elected to succeed him.



Our Hosiery Machines

automatically set up and drop off each stocking and make the anti-ravelling course, and, in addition to the cost of transferring the cuffs of half hose and the sewing of the welts of women's hose, these machines effect very pronounced savings, for instance—in the case of half hose, the ordinary ribbed machine is eliminated entirely, and, of course, the first cost of this machine, its maintenance and floor space, together with the knitting waste, the cost of cutting the ribbed top and the ravelling waste, which in the ordinary practice is unescapable, are entirely saved.

Transfer menders are altogether eliminated and the expense and annoyance of training expert help is avoided.

In respect of the women's hose there is no expense for severing the stockings, no sewing machine operation and consequently no waste on account thereof and a marked decrease in loopers ravelling waste, due to the fact that the stockings are pressed off to a course and not left with a crooked unevenly cut edge.

Established 1865.

Scott & Williams, Inc.

88 Pearl Street
BOSTON

NEW YORK **UTICA**

MERCERIZED YARNS

Dyers—Bleachers—Gassers

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Colors Fast to SUN and BLEACHING

ABERFOYLE

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Makers of the Celebrated

Dobbins Cotton Softener

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(A concentrated Scouring Compound)

and

DOBBINS ELECTRIC MILL SOAPS

Working Samples Cheerfully Furnished Gratis.

American Soap & Washoline Co.

Established 1861.

COHOES, NEW YORK

Largest Manufacturers of Textile Soaps and Soap Powders in the United States.

FOR ALL COTTON MILL USES.

The following concerns are now handling our Goods and will supply you at Factory Prices.

Waters-Garland Co., Louisville, Ky.; Carolina Supply Co., Greenville, S. C.; Southern Belting Co., Atlanta, Ga.; Montgomery & Crawford, Spartanburg, S. C.; Sullivan Hardware Co., Anderson, S. C.; Charlotte Supply Co., Charlotte, N. C.; McAnelly Hardware Co., Huntsville, Ala.

Bradley Stencil Machine

The BRADLEY STENCIL MACHINE
Makes Stencils fn half a minute, at reduced cost of 1-10c each
Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 30c or $3.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples.

A. J. BRADLEY MFG. CO.,

99 Beekman Street, NEW YORK

73 to 75 PER CENT PURE
CLARIFIED
CONCENTRATED
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CALCIUM CHLORIDE

TRADE MARK

Used by the largest Cotton Mills, Print Goods Manufacturers and Sizing Makers.

Write for Prices and Full Information.

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Home Office: Carbondale, Penna.

Branch Offices:—New York, Boston, Pittsburg, Philadelphia, Chicago, Baltimore, and New Orleans.

BOOK REVIEWS

All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.

THE DEVELOPMENT AND PROPERTIES OF RAW COTTON. By W. Lawrence Balls, M. A., 221 pages. Sixteen full page illustrations. Twenty diagrams in the text. Published by the MacMillan Company, New York City. Price $2.00.

In this book Mr. Balls has gone into a careful analysis of the development of the cotton plant and its pedigree. He has considered the development of the boll from a structural standpoint and also discusses the effects of environmental influences. He further takes up the matter of commercial lint in all its phases. The complete chapters, together with a summary of the development of cotton growing and an account of the methods used in the investigation, together with statistical data, completes one of the most thorough books on raw cotton it has ever been our pleasure to look over. What makes this book particularly interesting to the student of cotton plant conditions in America, is the fact that the author has considered and experimented almost entirely with Egyptian cotton. Therefore, considered as a carefully summerized description of Egyptian plants and usages, it is not only of particular interest to those manufacturers using Egyptian cotton in mills, but also to all cotton planters in America who desire carefully compiled facts concerning the growing and methods of handling the Egyptian cotton crop.

DOCKHAM'S CLOTHING MANUFACTURE AND CUTTING-UP TRADE REPORT AND DIRECTORY FOR 1915. 384 pages. Price $6.00. Published by the Dockham Publishing Company, Boston, Mass.

This report and directory lists manufacturers of clothing, awnings, sails, tents, flags, boots and shoes, trunks and bags, window shades, mattresses, rubber goods and many other classes of manufacture. Also jobbers of various textile manufactures; makers of cotton goods, department stores and New York offices. Altogether there are listed in this volume over 19.000 buyers.

PERSONAL EFFICIENCY, APPLIED SALESMANSHIP AND SALES ADMINISTRATION. By Irving R. Allen, President of the Irving Allen Company, Sales Counsellors and Advisors. 315 pages. Bound in flexible leather. Published by the LaSalle Extension University, Chicago, Ill.

Mr. Allen, the author, is an expert on sales organization and sales efficiency. He has had a wide experience in establishing and re-organizing sales departments and training salesmen. He has a big record back of him in making sales. This book is one of a series of works on business subjects by such men as Hugo Munsterberg, Samuel D. Hirschl, Edwin Herbert Lewis, Hugo Diemer, Henry Parker, Louis Guenther, Maurice H. Robinson, Elmer H. Youngman, E. H. Gaston, Paul Neystrom, and others. This series is used as a basis for the course in business administration at the LaSalle Extension University. The single volumes are sold separately for college class room use only. This book by Mr. Allen, which is the first of this series to appear, will prove of exceptional value to many manufacturers who, while being thoroughly experienced in manufacturing, are decidedly short on salesmanship. An inferior grade of goods well sold brings better financial returns to the manufacturer than a high quality of goods poorly sold at unremunerative prices. A successful cotton manufacturer should be a very versatile man and one of his accomplishments should be successful salesmanship.

The Coming of Automatic Looms.

Anticipating the close of the European war English manufacturers are looking toward the business future with prophetic eyes. At the annual meeting of the Textile Institute in Manchester recently, Oscar S. Hall, M. I .M. E. of Bury, read a paper on looms from which the following was abstracted by the *Textile Mercury* as showing the trend of English thought on this subject:

It was not intended (said Mr. Hall) to deal with any particular type of automatic loom, nor to compare one system of automatic looms with another.

At the beginning it was necessary to be satisfied that a satisfactory automatic loom had been designed and constructed from a mechanical point of view.

He thought that the day of automatic looms in England had dawned, that they were on the eve of a quicker development than had hitherto been experienced.

They must not overlook the dead weight of prejudice which had worked and still did work against the automatic loom. Automatic looms would lose nothing in appreciation if they could be put under the care of weavers in a new district who did not know but that they were the only system of looms in general use.

Incidentally he would touch upon the two kinds of automatic looms, the weft-changer and the shuttle-changer, simply to record the impression which he had come to long ago, after many experiences, that the future lay absolutely and entirely with the weft changer.

To approach nearer the practical, the essence of his paper. In his view the weaving industry of England was on the eve of a great change. Many and various were the factors tending to weigh down the balance more and more to the advantage of the automatic loom. Not only were there technical advances, but the changes in social legislation and conditions were steadily ensuring that the automatic loom should come into its own.

Let them take the National Insurance Act: For 1000 automatic looms they might assume 50 operatives were required; for 1,000 ordinary looms 200 operatives. At present within the weaving industry there was only Health Insurance; it was only a question of a short time when unemployment insurance would be added. The saving now would pay interest on part of the necessary greater capital expenditure, and on a greater part when the provisions of the Act increased their hold on the weaving industry.

Take the Workmen's Compensation Act: The charge was a percentage on wages, therefore there was a further saving on this score with automatic looms.

War bounties: The man with automatic looms had a tendency also at present was for a higher remuneration of less aggregate to pay in proportion to his production. The labor, and the possibility was increased of this tendency becoming effective by reason of a shortage. There was, owing to the war, a shortage of labor in many mills. Higher wages ever brought more labor-saving machinery into existence. Further, there was the possibility of allowing looms to run after the operatives had left the mill. About two years ago he stood in a small department of a mill. There were 60 automatic looms. A man and a woman attended to them; the man had 35 and the woman 25 looms. They went to dinner. He stayed behind. The looms were left running. In half an hour he counted the looms still running; there were forty!

If that is the trend of English thought it is possible that the close of the war will see a general adoption of automatic looms in England. This will increase the competitive difficulties of those mills in this country still using the old style common loom.

The factory of THE GRAPHITE LUBRICATING COMPANY, in Bound Brook, N. J., now occupies an entire city block, which contains two departments, consisting of what is known as the Bound Brook department and the Nigrum department.

In the Bound Brook department are manufactured Bound Brook graphite and bronze oil-less bearings, which have been well known throughout the country for more than twenty-five years.

The Nigrum department is new in the sense that the product has been put on the market in the last two years after eight years of careful experimenting and study. This department has grown so rapidly that there is absolutely no room at the old plant to take care of its required production, therefore, the Graphite Lubricating Company have bought a property that is two miles from the old plant, covering a plot of more than 500 by 200 feet, situated on the main boulevard to New York, on the tracks of the Central Railroad of New Jersey, Philadelphia & Reading Railroad and the Baltimore & Ohio Railroad. A side track is available from all of these roads.

The buildings on the new property, for the present, will consist of one building 30 by 130 feet, and another building 40 by 120 feet, two stories, which gives ample store room. The first mentioned building will be used for the machinery necessary to finish the bushings in their respective shapes and sizes, while the first floor of the second building will contain a very commodious office and what is known as the impregnating room. The second floor of this building will be a stock room where graphite impregnated wood of all sizes will be carried so that quick delivery can be made of all hurry-up orders. These new buildings will be known as Plant No. 2 and will be used only for the Nigrum graphite impregnalid wood department, leaving the Bound Brook and bronze department at the old plant.

While the Graphite Lubricating Company are making a specialty of graphite impregnated wooden bushings for all uses such as loose pulleys, friction clutches, ventilating and automobile fans, spindle bearings, saddles, they are also paying particular attention to skewers and dowels, which means a large saving in breakage. Dowels made of their material need no lubrication, and are practically everlasting. They will be glad to furnish information upon request. They have a very handsome booklet covering this proposition , which will be forwarded to any one interested.

Superintendents, engineers and master mechanics can receive a booklet containing tables and other valuable information which they should have at hand by applying to the AMERICAN STEAM GAUGE & VALVE MANUFACTURING COMPANY, 216 Camden street, Boston, Mass. It costs nothing and is worth a great deal. Send now before the supply is exhausted.

The Charlotte office of the ARNOLD HOFFMAN CO. has been changed from Room 506 Independence Building to Rooms 806 and 807, where a very handsome suite of offices have been prepared. R. E. BUCK, the genial and popular Southern manager, will be glad to welcome his many friends, and extends a cordial invitation to all of them to call and inspect his new equipment.

COMPARATIVE DELIVERED COST OF SLAG AND CRUSHED STONE COMPILED FOR THE BENEFIT OF CONTRACTORS BIDDING ON AN IMPORTANT REINFORCED CONCRETE PROPOSITION WHERE THE FREIGHT RATE IS GREATLY IN FAVOR OF STONE

Comparison based on a requirement of 5,000 cu. yds. of 1¼" Aggregate.

Weight of stone conservatively estimated.....2,600 lbs. per cu. yd.
Actual average weight of slag.....2,000 lbs. per cu. yd.
Delivered cost of stone.....$1.70 per cu. yd. | Wagon Haul .....1 mile
Delivered cost of slag ..... 1.30 per cu. yd. | Hauling charge .....15c ton

COST OF MATERIAL AND HAULING

5,000 cu. yds. of crushed stone @ $1.70.....	$8,500.00	
5,000 " " " " slag @ 1.30.....	6,500.00	
		$2,000.00
Weight of 5,000 cu. yds. stone.....6,500 tons		
Weight of 5,000 cu. yds. slag.....5,000 tons		
Saving in weight, favor of slag.....1,500 tons @ 15c		$ 225.00
Saving in cost of material and hauling favor of slag		$2,225.00

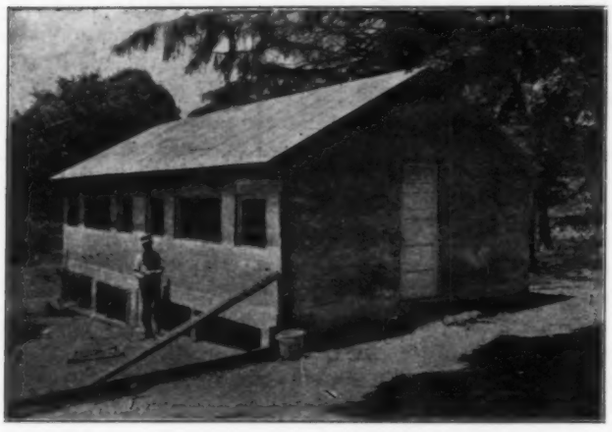
In addition to the above, you may conservatively estimate an additional 10% saving in all handling costs, due to the fact that slag is at least 600 lbs. lighter than stone per cubic yard.

Slag contains absolutely no foreign matter and does not vary materially in analysis as produced by the furnace from day to day, the year round. This is necessary because upon the analysis of the slag, depends the analysis of the iron.

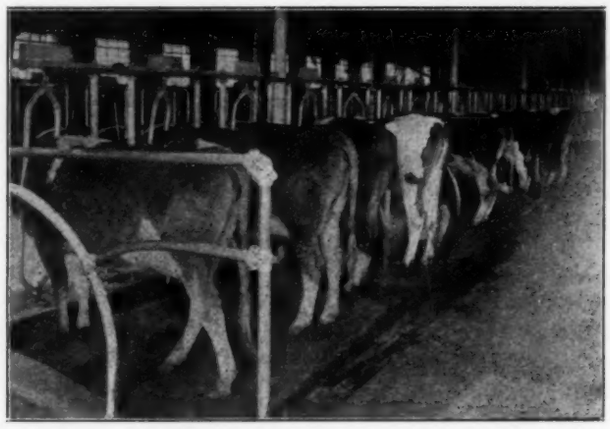
While slag makes a much stronger, and at the same time, lighter concrete than either stone or gravel, it also absolutely protects the reinforcing metal from corrosion.

Upon request, we will be pleased to furnish complete analysis and disinterested testimony corroborating our claims.

BIRMINGHAM SLAG COMPANY, 1001-6 Woodward Bldg., BIRMINGHAM, ALA.



Farmers are using concrete for all types of buildings. Small structures are erected without skilled labor. Buildings of this kind mean elimination of maintenance charges, such as painting and repairs. Furthermore, they are sanitary, fireproof and in the end cheaper than the cheapest type of frame construction.



Sanitary precautions on the dairy farm are absolutely essential. Dairy barns are now built from foundation to roof of unburnable, non-decaying and everlasting concrete. Such structures can be easily cleansed and afford no harbor for rats, vermin or other noxious or disease-creating agencies.

Concrete Construction on American Farms

IT is a popular notion that the great bulk of the Portland cement manufactured in the United States, which now represents an annual output of nearly a hundred million barrels, is consumed in large engineering enterprises and municipal improvements. As a matter of fact, however, many millions of barrels are used annually upon the farms of the United States.

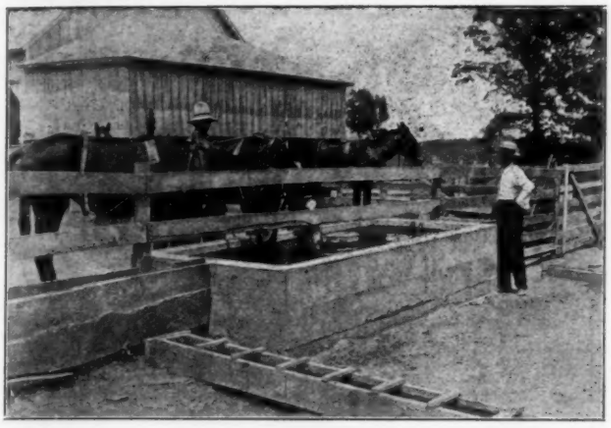
The American farmer has come to a realization of the fact that most of his structural work has been costly and extravagant through rapid deterioration involving constant repairs if not renewals. He has also discovered that cement represents economy other than that to be found in permanent construction. For example, millions of dollars have been wasted annually by feeding grain on the ground, a large part of it being trampled into the mud or dust and irretrievably lost. To prevent this waste progressive farmers are putting down feeding floors of concrete, which pay for themselves within a year or two through the saving of grain alone. On some large farms the area of these pavements comprises many square feet beyond the requirements of a mere feeding floor. Concrete, owing to its impervious nature, is also effecting a large saving through the protection of grain in storage, large quantities of which are destroyed each year by rats, mice and other destructive agencies. The value and economy of concrete to the farmer have been so clearly demonstrated that he is likely to become one of the largest users of cement, taking farm consumption in the aggregate. His education along this line began only recently and on many farms owners are merely waiting for present inferior types of construction to require renewals before they engage in concrete construction on a larger scale. This will mean a marked increase in the demand for cement throughout rural districts.

Always free from mud and dust, concrete roads answer the purpose of motorists, horsemen and pedestrians alike. They are a boon to the farmer's family as well as to himself. Concrete roads are passable at all seasons of the year. They are built with a flat crown and gritty surface texture, which prevents horses and cars from slipping. They cost little in excess of well-built macadam roads while average maintenance costs have not exceeded $30 per mile per year.

The farmer, as a rule, has used cement successfully. Failures due to the use of improper materials or poor workmanship have been very few compared with the thoroughly excellent work accomplished in all sections of the country. But he is becoming better informed upon the subject from day to day and is now undertaking quite important projects, even to the building of substantial barns and like structures.

One of the conspicuous advantages of concrete construction is that it may be done without skilled labor where there is proper supervision. Suitable materials in the way of sand and stone are to be found in practically all sections of the country, thus bringing the proposition down to a matter of labor cost rather than cost of material.

Among all modern structural materials concrete



Concrete being a plastic material, it can be cast in any form, and become a solid and seamless mass. This makes it especially adaptable in hydraulic work. On the farm concrete is supplanting decaying and filth-absorbing wood for watering troughs, cisterns, tanks and kindred types of construction. Where used for watering tanks the customary mud hold found around wooden tanks has disappeared. Concrete tanks last indefinitely and require no repairs.

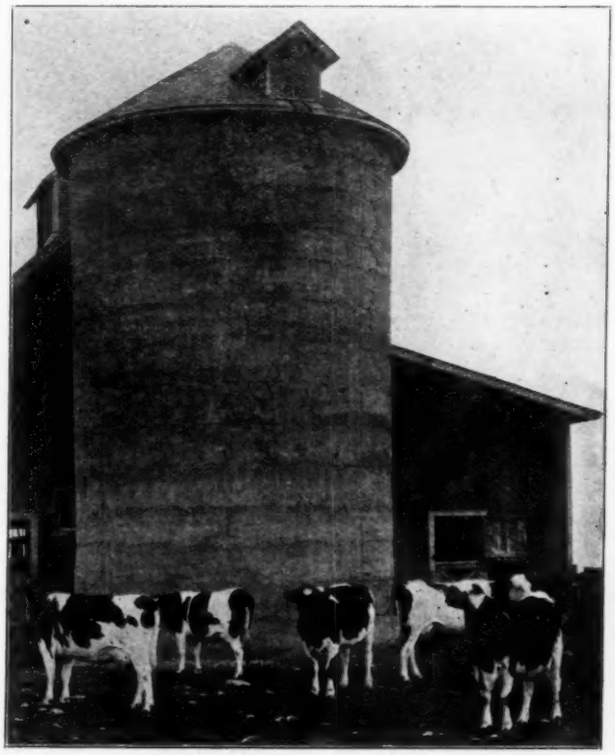
The farmers of the United States have wasted millions of dollars annually by feeding grain on the ground. Concrete feeding floors prevent stock from trampling it into the mud and dust. They are cheap and sanitary.

alone shows increased strength with lapse of time and exposure to the elements. It is the best of our fire-resisting materials. It does not shrink, warp or decay. Hence the almost total elimination of outlay for painting, repairs and renewals. Being a plastic material, concrete may be cast into any form and left to harden into indestructible stone. It may be made into seamless monolith, a virtue of pronounced advantage in the construction of dairy plants, cisterns and kindred structures calling for sanitary precautions.

As stated, concrete is reasonable in first cost. This is illustrated in the case of concrete silos, which can be built, taking the average, for about $2.50 per ton capacity. The first cost is the whole cost, as a well built concrete silo requires no repairs. In a number of instances frame barns have been destroyed by fire, leaving these huge stone jars and their contents intact. Their weight is such that they never blow down. Again, concrete has become a very important economy in the matter of fencing. Concrete fence posts do not decay at ground level as in the case of wooden posts. Furthermore, they keep in better alignment and are never destroyed by fire. On a large country estate near Philadelphia posts of concrete were made at a cost of only 23½ cents each, notwithstanding the fact that all material was purchased. In brief, the farmer has become so impressed with the value of this material that he is now using it for practically every purpose for which wood and stone are employed. He is building barns, stables, corn-cribs, cisterns, sidewalks, poultry houses, feeding floors, dipping vats and fences of indestructible concrete.

Perhaps the greatest good that is to come to the American farmer through the advent of concrete will be found in its application to roads. The utility and economy of the concrete road was fully described in a previous issue, but it may be repeated that in the case of concrete highways, as in building construction, maintenance becomes a negligible factor. Wherever extended concrete road systems have been built land values have increased. In some localities they have more than doubled. But the users of these roads no longer talk about their first cost or low maintenance. They consider only their value to them as individuals in that they bring direct and immediate pecuniary profit instead of being a burden to the taxpayers.

The foregoing is a partial review of present farm uses of this important structural material and without question the consumption of cement upon the farms of the United States will be largely increased.



The feeding of silage was an important step forward in American agriculture. Concrete has solved the problem of preserving this valuable feed at minimum cost. Concrete silos cannot shrink, warp or decay. It is impossible to burn them and they do not blow down in violent wind storms. They are recommended by agricultural experts throughout the country. Average construction cost has been $2.50 per ton capacity.

ARABOL GUM G.

A. Attracts Moisture and Softens the Yarn.
R. Retains the Moisture, Making the Yarn More Pliable.
A. Adds Strength and Elasticity.
B. Boils Thin; Thereby Penetrating the Yarn.
O. Opens the Yarn, Preventing Break-Backs.
L. Lays the Fibre.

Trial Orders Shipped on Approval—
Especially Valuable in Hot Dry Weather

Arabol Manufacturing Co.

100 William Street, NEW YORK CITY
Southern Sales Agent, CAMERON MacRAE, - Charlotte, N. C.

Gate City Cotton Mills

1209-10 Fourth National Bank Bldg.,
ATLANTA, GA.
Manufacturers of Superior Quality
RING SPUN
HOSIERY YARN
We Sell Direct to Knitters and Guarantee Satisfaction.

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American Moistening Co. 8
American Soap and Washoline Co. 75
American Supply Co. 85
American Textile Banding Co. Inc. 71
Arabol Mfg. Co. 80
Atlanta Stamp & Stencil Wks. 88
Augusta-Aiken Railway & Elec. Corp. 28

B

Barber-Colman Co. 8
Barber Mfg. Co. 73
Barrett Mfg. Co. 67
Bayer Co. 95
Beer, H. & B. 86
Bird-Wilcox Co., Inc. 26
Birmingham Slag Co. 77
Boomer & Boschert Press Co... 8
Boss Knitting Machine Works.. 13
Bosson & Lane 97
Boston Economy Lamp Div. .. 14
Bradley Mfg. Co., A. J. 75
Brinton Co., H. 13
Bull, Wm. C. 8
Butterworth & Sons Co., H. W. 98

C

Carbondale Calcium Co. 75
Cary Mfg. Co. 11
Cassella Color Co. 96
Central of Georgia Railway... 91
Clayton, J. M. 30
Clayton & Bentley Co. 5
Cole Bros. 8
Combustion Appliances Co..... 28
Connecticut Mill Supply Co..... 10
Corn Products Refining Co..... 20
Cortright Metal Roofing Co... 73
Crompton & Knowles Loom Works 4
Covell Belting Co. 1
Cramer, Stuart W. 22
Curtis & Marble Machine Co.. 7

D

Davis, Rogers W. 4
Delahunty Dyeing Machine Co. 96
Detroit & Cleveland Navigation Co. 90
Diamond State Fibre Co. 71
Diener Mfg. Co., Geo. W..... 13
Dixon Crucible Co., Jos..... 32
Dixon Lubricating Saddle Co.. 14
Dobbins Soap Mfg. Co..... 75
Double Service Tire & Rubber Co. 82
Dowman-Dozier Mfg. Co..... 17
Draper Co. .....2 and 3
Dufur & Co. 14
Dunn & Kruse 71

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Economy Fuse & Mfg. Co. 69
Electric Smelting & Aluminum Co. 73
Emmons Loom Harness Co. ... 82
Erie Pump & Equipment Co... 23
Erdle Perforating Co. 14
Eureka Chemical Fire Pail Co.. 15
Eureka Fire Hose Mfg. Co.... 15

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Farbwerke-Hoechst Co. 83
Fawcett, Hughes 86
Felton Brush Co., D. D. 32
Firsching, J. A. 73
Foster Engineering Co. 16

G

Garland Mfg. Co. 32
Gate City Cotton Mills..... 80
General Electric Co. 31
Georgia Railroad 91
Georgia School of Technology.. 71
Gibson Mfg. Co. 87
Graphite Lubricating Co. 30
Graton & Knight Mfg. Co. 21

H

Hausburg, E. O. 85
Hemphill Mfg. Co. 10
Henderson & Co., Chas. F.... 86
Hill & Ferguson 88
Hilliard Clutch & Machinery Co. 30
Hotel Birmingham 86
Hotel Cawthon 90
Hotel Broadway Central 90
Hotel Chelsea 89
Hotel Martinique 90
Hotel Powhatan 89
Hotel San Carlos 90
Hotel Tuller 89
Hotel Van Rensselaer 88
Hotel Woodstock 89
Howe Mill Crayon Co. 71
Howard & Bullough American Machine Co. 65
Howard & Morse 14
Howard Clock Co., E.....100
Hungerford & Terry, Inc..... 14
Hunt Co., Inc., C. W. 16

I

International Pulp Co. 85

K

Kellogg & Co., E. H. 88
Kildust Co. 85
Klipstein & Co., A. 94
Koven & Bro., L. O.....100

L

Lanett Bleachery & Dye Wks.. 96
Leigh & Butler 86
Lewis, John D. 73
Lindsay, Hyde & Co. 8
Lombard Iron Wks. & S. Co.. 94

M

Malt-Diastase Co. 95
Mason Co., Robt. D..... 96
Matthews, Ph. D., J. Merritt.. 88
McMorran & Co., Edw. W.... 14
Merrow Machine Co. 10
Missouri Lamp & Mfg. Co..... 15
Morehead Mfg. Co. 18
Morris Machine Works 94

N

N. Y. & N. J. Lubricating Co. 81
Norwich Belting Co. 19
Norwood Engineering Co..... 27
Nye & Tredick Co. 11

O

Oliver, A. M. 88
Onofrezo Fire Extinguisher Mfg. Co. 15

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Palmer Co., E. I. 9
Pass & Seymour, Inc. 22
Paulson, Linkroum & Co.... 86
Pearson, J. T. 7
Phila. Drying Machine Co....100
Phila. Textile Mchy. Co. 98
Philadelphia Textile School... 87
Putnam-Hooker Co. 86

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Reliance Machine Works 10
Rice Dobby Chain Co. 7
Richardson & Co., Alonzo 87
Roberts & Son 71
Roessler & Hasslacher Chem. Co. 96

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S. K. F. Ball Bearing Co....100
Saco-Lowell Shops 4
Salkeld & Bros., A. D. 86
Sargent's Sons Corp. C. G..... 95
Searchlight Company, The 27
Schofield Co., Wm. 8
Schofield's Sons, J. S. 27
Schwartz & Co., L. H. A....100
Scott & Williams, Inc..... 74
Scovell & Co., Clinton H.... 73
Seydel Mfg. Co. 84
Shambow Shuttle Co. 69
Sirrine, J. E. 88
Small, Hankin & Simms 30
Smith, Drum & Co..... 99
Solvay Process Co..... 95
Southern Coal & Coke Co. 24
Southern Railway 91
Southern Textile Exposition... 25
Spiker, W. C. 88
Stafford Co., The 6
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Standard Oil Co. 18
Steel Heddle Mfg. Co..... 81
Stuart-Howland Co. 88
Sykes & Co., Walter F. 94

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Textile Finishing Mch. Co..... 99
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Toomey, Frank, Inc. 85

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United & Globe Rubber Mfg. Companies 14
U. S. Conditioning & Testing Co. 32
U. S. Hoffman Co. 9

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Walker Roofing Co. 13
Walsh & Weidner Co. 71
Webb & Vary 91
Wedderburn, Alex J..... 87
Weimar Bros. 87
Weller, Francis R..... 88
Westinghouse Elec. & Mfg. Co.. 29
West Point-Lanett Chamber of Commerce 73
White Co., The 92
Whitinsville Spinning Ring Co. 7
Whiton Machine Co., D. E... 94
Wildman Mfg. Co. 12
Wolf & Co., Jacques..... 94
Woodward, Baldwin & Co... 86